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Matching Your Production and Marketing Alternatives: Finding the Right Fit

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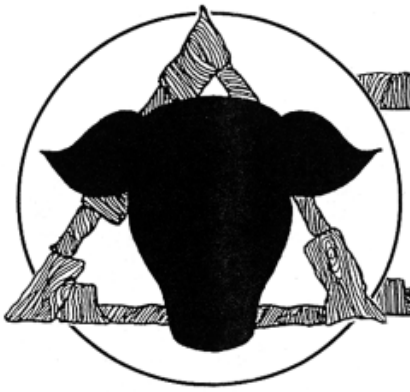

Managing for Today's Cattle Market and Beyond

Market Plan

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Introduction

A market plan is a scheme designed to assist in the pricing and movement of products to market. A market plan can be as simple or as complex as desired. The most complex approaches include everything from long term family goals and objectives to very elaborate execution plans. Simpler approaches usually concentrate only on pricing objectives. More complex forms usually are in written form — simpler plans may be only in "someone's head" or with a broker.

Regardless of the approach used in developing market plans, there is one critical key. Plans are only as good as their execution. Complex plans that are not used are not as good as very simple plans that are used. Some of the major areas which should be considered in market planning are discussed below.

Why Develop A Marketing Plan?

There are many misconceptions about a marketing plan. Many farmers/ranchers feel it is so difficult to predict prices in the future that planned marketing is a futile exercise. The inability to predict the future with certainty is why planned marketing is important.

Market planning is not a one-time task. It must be a continuous flow operation. The plan must be flexible because factors affecting farm output and market prices will change continuously over time.

A marketing plan is the management strategy for realizing the full potential profit from farming/ ranching. A well-defined marketing plan is as useful to a farmer/rancher as a game plan is to the football coach. Successful coaches always have a workable strategy with specific objectives. Farmers/ranchers also must have a game plan for the task of profitably marketing their products if they are to be successful in the long run. A plan allows a farmer/rancher to market his products, not just sell them. The plan must be based upon the objectives of the business.

Elements of a Marketing Plan

There are many factors that go into developing a viable marketing plan. Most are based on the following questions: The product decision or "What product(s) do I produce and sell?", the pricing decision or "What price do I need to sell my products for to meet my objectives?", the methods decision or "How do I establish a price for my product?", and the merchandizing decision or "When, where and how do I make delivery of the product to the buyer?"

Self Assessment

A market plan is not a recipe or cookbook which can be distributed and used by all. It must be tailored and designed to meet the various needs of each unique

operation. Both long and short term goals and objectives should be considered. An evaluation of required cash flows, everything from servicing debt or providing for family living, should be included. Attitudes toward forward pricing, including whether or not they will be used, which types are acceptable, and how they will be implemented, have a major impact on the market plan.

Planning is necessary -- remember this is a market plan. If one does not know where one is, it is almost impossible to know how to get "somewhere else" in an efficient manner.

Cost of Production

One way to establish pricing objectives is to start with the cost of production. Determining the cost of production is not an exact science. Some costs will be available from farm records. Others must be estimated. You must be fair in allocating costs. Do the best job you can. Then, be ready to make changes.

Costs should be divided into categories. One such division is fixed versus variable costs. Fixed costs include expenses you would have even if you didn't produce anything — interest on facilities and taxes. Variable costs include expenses that result from producing something (cattle) — feed, feeder cattle, vet expenses and hired labor. Remember, in the short run, receipts must cover the variable costs. If not, the best alternative is to "produce nothing".

One final comment on cost of production is needed. If you are a person who says "I'm going to produce cattle even if I don't know my costs", don't give up on a market plan. Rather, concentrate on executing the plan to best meet your goals and objectives. That may be nothing more than some preconceived price level. Remember, knowing your costs will help determine whether or not you made a profit. But, even if you don't know your costs, you still must "sell what you produce". You still want to do the best job of selling that you can.

Setting Triggers

A market plan must be executed to have value. The best way to do that is to set triggers. Triggers usually follow the form of "if this happens, I will do that". An example for feeder cattle might be "If I can lock in a $60 price, I will do that for one-half of my production." Then, if higher prices are offered, I will price more of my production. Given that prices change from year to year, trigger prices also may need to be changed regularly.

Sometimes, it is best to put "pulling the trigger" into someone else's hands. That could be a spouse, broker or another partnership member. That doesn't mean you don't have input in developing triggers.

Using breakevens is one way to develop triggers. The following simple example may illustrate the concept.

Item	$/cwt	Running Total
Total variable costs	$40/cwt	40
Family living needs	10/cwt	50
Desired profit	5/cwt	55
Fixed costs	3/cwt	58

One trigger might be set at $50 for one-fifth of expected production, another fifth at $55, and another 40 percent at $58. And, all production could be priced if prices were above $60. Trigger levels must be set for each situation. A good level for one person one year may not be good for someone else or at another time. Numbers used should be realistic and yours, not your neighbors.

Pricing Methods

There are many pricing methods available to cattle producers. Some, such as selling futures and cash forward contracts, can be used to put in price floors. There is also upside price potential. Others such as buying puts, can be used to put in floors and still leave the upside open. Forward pricing alternatives are discussed in greater detail in other articles.

Methods included in the market plan should include only those with which you feel comfortable. For some, that may mean only the cash market or cash forward contracts. For others, the futures market and/or options might be included. For others, combinations of pricing strategies might be used.

A single expected price from each of the alternatives cannot tell you the whole story, however. You must recognize that there is risk involved and that likely means there is risk in projecting only one price for each alternative. One way to determine risk is to ask not only what the most likely price is for each alternative, but also what the optimistic, pessimistic, best and worst prices may be.

You should understand what each alternative

can and cannot do. That may mean you will need to attend workshops, obtain study materials, and "do some learning". You may be required to "change your thinking". Looking for an acceptable price and being happy with it may replace always trying to top the market.

In selecting pricing methods, remember that what worked for you last year may not work today. What worked for the neighbor may not work for you. Some pricing methods provide better protection on the "downside" than the "upside". You should know whether you are more "offensive" or more "defensive" minded. This may require some work, especially self evaluation.

Making the Decision and Following Through With the Plan

Making the pricing decision is the hardest part of planning a strategy. The procedure described is designed to lead to a well-informed pricing decision consistent with the goals of the operation.

The decision-making procedure can be summarized as shown in Figure 1. Each evaluation leads to a result and an action. The actions offered as examples reflect the possible results listed and are worthy of consideration but are not meant to be exhaustive or prescriptive. The lines indicate the process is a continuous flow. When a partial pricing or wait to price action is taken, the process is repeated as prices change and new fundamental information is obtained.

Most successful pricing plans do not rely on one strategy, but are combinations of strategies. Each plan should include a "backup" or contingency plan in case prices do not reach specified levels. For instance, a producer may determine there is a reasonable chance of a price rising to his price goal sometime during the production process. While waiting for the rise, he may use a moving average pricing strategy or purchase put options to reduce the chance of price declines below his critical level.

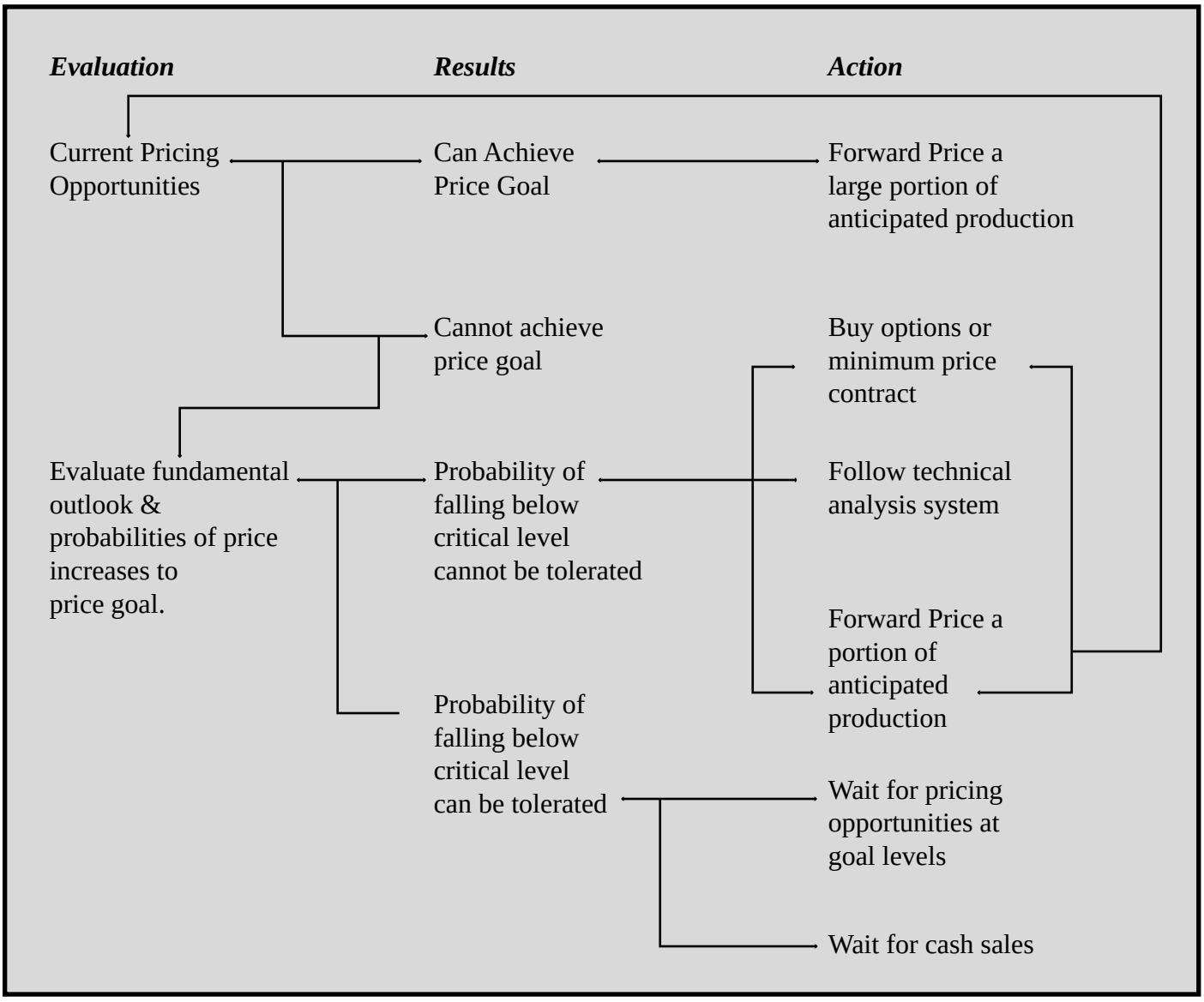
Once a decision is made, the producer should execute it. In sports, the most important part of any activity is the follow through. The same can be said for business plans and decisions. Don't procrastinate. Make a good decision, and carry it out. It is likely the outcome will be as planned.

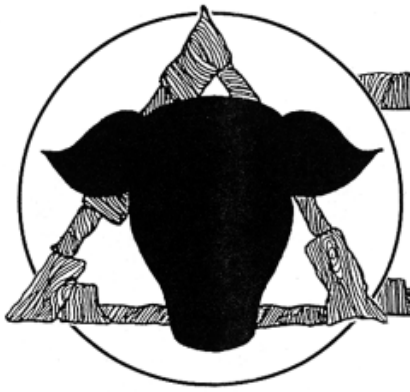
Evaluation

When the action is completed it is time to evaluate the results of the plan. Did the plan meet the objectives? Were the objectives relevant? Was the decision based on current knowledge? Has any new knowledge surfaced since the decision that could have changed the decision? What did I learn from this experience? What should I have done differently?

The questions should be asked each year to improve marketing plans.

Figure 1: Pricing Decision Making Summary





Managing for Today's Cattle Market and Beyond

Marketing Alternatives That Can Be Considered In Your Business Plan Today

By
Chris Bastian, University of Wyoming

Often times the production process takes so much effort that the marketing of the product becomes just a sale after weaning or coming off pasture. As such, producers often seem to get in a marketing rut. It isn't until market prices drop that serious consideration is given to marketing alternatives. This article, and the next, will discuss the alternatives you can use right now to manage your price risk and perhaps meet your goals. The purpose of this article is to present some of the marketing alternatives available to you right now, and the next article entitled, "Comparing Your Marketing Opportunities" discusses the advantages and disadvantages of these alternatives.

Alternatives

Price at Delivery - Auction

Price at delivery is a primary marketing method used by producers selling livestock. This type of market alternative basically just requires the producer deliver the product to the market location whenever the producer is ready to sell. The timing of the marketing decision is often linked to production operations such as harvest or weaning. In general, the producer delivers whatever quantity of product he/she wishes to sell and accepts the price dictated by the market. The producer usually has the option to accept or not accept the price offered. However, if the offer is refused, additional costs may be incurred due to transportation, interest, etc. while exploring other alternatives or waiting for a better price. Selling cattle at the local auction is an example of this alternative.

The major costs of marketing at an auction are commission and yardage. Lesser deductions may be made for such items as insurance, feed, state inspection, state fees, National Livestock and Meat Board checkoff, and brand inspection. A considerable variation exists nationally among auctions in the determination of commission charges. Some auctions assess commission on a per-head basis, others on a percentage of the proceeds, and some on a combination of the two. Other costs which must be considered by producers are shrinkage and transportation which are incurred prior to the livestock entering the auction ring.

Forward Contracts Forward Pricing

It is possible to obtain a forward price contract for some types of livestock. Many livestock buyers will contract to purchase a given amount of these commodities at a set price for delivery in a later month. Contract sales remove price uncertainty but do not allow selling at a higher price if prices rise later in the year.

Even with a contract there are risks of non-performance or misinterpretation. These risks can be minimized by carefully reviewing terms of the contract and credibility of the buyer. Both buyer and seller need to understand all terms of the contract before signing the

agreement. If you still have questions, it might be wise to have an attorney familiar with contract law review the agreement.

Cattle Contracts

Direct sales of beef cattle can reduce transportation and handling problems, actual shrink (usually there is some pencil shrink though), and commission and yardage costs compared to selling cattle at an auction. In general, the buyer contracts for a certain quantity of cattle, weighing within a certain range, to be taken possession of at some future point in time for an agreed upon price.

While the majority of cattle buyers are honest, previous experience indicates that some take advantage of unsuspecting sellers. Most problems involve non-payment for livestock. Many times the cattle are taken from the state of origin, making it difficult to repossess or to receive payment. In the past a verbal commitment and a handshake from a buyer you knew were sufficient. However, today's livestock seller should exercise more caution to ensure an equitable transaction is accomplished. Each year situations develop where some livestock producers are faced with non-payment when selling their cattle direct to buyers. The risk of non-payment, non-performance, or loss of title when selling direct to livestock buyers can be minimized by following a few guidelines.

It is a good practice to check out the legitimacy of the buyer. First determine the license status of the buyer or the dealer the buyer works for. Buyers who are employed by brokers and dealers generally buy under the dealer's license and must be individually bondable. Dealers or brokers applying for licensure must identify all buyers and must provide evidence that each buyer has been registered with a bonding agency. Each buyer is issued a buying a card. Sellers should inspect the buying card and note the number and expiration date if there is any question the legitimacy of a buyer who claims to be operating under the authority of someone else's license.

To receive a license, the dealer must meet certain criteria and post a performance bond. Individual states will have different requirements as to the type and amount of state department bonds. A $10,000 bond through the Packers and Stockyards Administration is usually also acceptable. The relatively low bond does not provide much protection to the seller, but it does ensure some minimal financial standards have been met. These rules and regulations vary from state to state, and can be determined for your state through your state Department of Agriculture. You might also ask for some financial references such as the buyer's banker. The financial reference can verify if the buyer does in fact have an account with the institution, and perhaps the reference might offer an opinion as to the legitimacy of the buyer as a business person.

The bill of sale can be useful to protect the seller's title to the livestock until payment is received. By retaining the bill of sale, the seller retains title to the livestock. Buyers have an understandable desire to receive the bill of sale at delivery because it is proof of purchase. It is possible to modify the bill of sale to include provisions to retain possession of title until payment is made.

By designating the document as a bill of sale and contract, it becomes more useful for both buyer and seller since it summarizes not only the sale transaction, but also the provisions of the sale. This can be extremely useful in the event the seller must later repossess and prove ownership, origin, or title to the livestock, or must initiate litigation against the buyer. It also is useful when establishing a claim on livestock which have been resold one or more times after the original sale.

Between states, the bill of sale requirements may vary. You may want to check with your state authorities concerning what information is and can be specified in the bill of sale.

Another consideration concerning direct sales of livestock is method of payment. Currently, a wire transfer is the payment method recommended by some financial institutions. If the seller withholds title until the transfer is confirmed, a wire transfer is virtually foolproof and practically eliminates payment risk for the seller. However, even the limited time lag may hinder its usefulness. Other methods that have a relatively low risk are cashier's check, certified check, or a letter of credit. The letter of credit is especially useful for recurring transactions. A cashier's check is good for out-of-state or unfamiliar buyers, but is not convenient for buyers. A certified check may not be convenient for buyers either because it is usually pre-drawn in a specific amount.

Other specifications or factors to be considered are any weight, sex and quality standards specified by the buyer. Usually the buyer has looked at your cattle and has drawn conclusions concerning quality, but since the cattle are to be delivered at some future point in time some of the expectations concerning weight and so on may need to be specified in the contract. Also, the provisions for any price premiums or discounts based on those specifications should be spelled out in the contract. For example, what happens if the cattle are expected to average 500 pounds upon weigh-

ing? If the cattle are heavier, the buyer may discount the price. The price discount or slide should be specified in the contract.

Transportation and shrinkage costs must also be considered when entering into a forward contract for livestock. Where are the cattle to be weighed and when? If they are to be weighed off your place, how much will transportation and shrinkage cost you? Additionally, a pencil shrink is often specified. What are the weighing specifications? For example, if the buyer asks for an overnight dry stand before weighing the cattle plus a pencil shrink, the buyer is discounting your cattle significantly through loss of payweight. Additionally, be sure who accepts liability concerning death loss on the truck. Normally it should be the trucking firm, but if there is any doubt, specify it in the contract.

These considerations can minimize potential risks livestock producers face concerning non-payment, non-performance, loss of title and unfair marketing costs when selling direct to livestock buyers. Be sure to verify the qualifications and financial adequacy of prospective buyers, insist on acceptable payment methods, retain title to the livestock until final payment has cleared the financial institution, and don't accept unfair practices which dock your payweight heavily.

Video Auctions

Video auctions have gained wider acceptance as a method for marketing cattle. This method entails producing a videotape of the animals being sold. Then, after buyers have received written description of the cattle, an auction is held. The sale is conducted with buyers assembled in a room looking at TV monitors and/or beamed by satellite to other buyers who bid by telephone. Completed sales become cash forward contracts since all cattle are sold for future delivery.

Detailed Description of Video Cattle Auction

The following discussion comes from "Current and New Beef Marketing Technology (Electronic)" (reference in the appendix).

For illustrative purposes this section will use the Superior Livestock Auction. this does not endorse this auction, but uses it as an example of how a video auction works and its requirements. These will vary some among auctions. Video auction cattle presentations consist of two components— the video or visual component and the sale catalog or written component. A $2.00/head videotaping fee is included in the sale commission unless the seller rejects the bid, in which case the seller forfeits the taping fee. The taping is done by one of Superior Livestock Auctions's (SLA) regional representatives. Thus, the integrity of the video auction is heavily dependent on the integrity of its regional representatives. Sales catalog descriptions are prepared by the video auction company and the seller when the cattle are videotaped.

Videotapes of about two minutes in duration are shown while an auctioneer solicits bids. Buyers must register in advance of the sale and undergo a credit check in order to participate. Buyers may bid either in person or by telephone from any location where the satellite transmission can be received.

The video auction representative oversees delivery. Although the video auction representative is responsible for ensuring contract compliance by both buyer and seller, buyers are permitted to be present at delivery.

Each video auction has its own set of terms. A buyer must register with the Auction prior to the sale, and be issued a buyer's number. Only qualified, pre-registered buyers with issued numbers are allowed to bid in the sale ring.

Hedging with Futures

When a producer plans to sell a commodity, he/she can use a short hedge to lock in a price and protect against price decreases. It is important to remember that if you plan to sell the commodity in the future, you need to sell in the futures market when you take your initial position. Otherwise you will not be locking in a future sale price for your commodity. A producer can also use the futures market to lock in a future purchase price of a commodity such as feed. In this case, you plan to buy the commodity in the future, and thus, you need to buy a futures contract when you take your initial position. This is called a long hedge. Another article entitled "Futures Markets - Basic" discusses using the futures market in more detail in this publication, but it is important to remember this is an important forward pricing tool which can be used to lock in a future sale price or a future purchase price of a commodity.

Using Agricultural Options

An option contract is simply an agreement which allows the purchaser the opportunity, but not the obligation, to buy or sell a futures contract at a specified price. Since buyers of options have the "option" but not the "obligation" to exercise their right to buy or sell futures contracts at a specified price (referred to as the strike price), they are called "options."

An option is like an insurance policy. Just as a producer may purchase the right from an insurance agency to collect on a policy in case of a disaster, he or she may purchase the right to buy or sell a com-

modity (through a futures contract) at the strike price in case of a disastrous price move. As in the case of an insurance policy against fire, the producer must pay a premium to insure against commodity price declines or increases. A producer could collect on the option if the price moves in an unfavorable direction.

There are two types of options. They are the "PUT" option and the "CALL" option. The put option is purchased by the producer who wants to insure against price declines. The put option insures a minimum selling price for the option buyer who has a commodity to sell. The put option gives the option buyer the right to sell a particular futures contract at a specified price. The call option gives the option buyer the right to buy a particular futures contract at a specified price. The options then can be used to set a minimum selling price (put) or maximum purchase price (call) for a commodity at future point in time. How this tool can be used will be explained in more detail in an article entitled "Commodity Options As Price Insurance For Cattlemen" in this series.

The advantage of using a put option is that you can protect yourself against falling prices, but you are not locked into a price if prices rise. That is because you have the option, but not the obligation to exercise the option into a futures position. The advantage of using a call option is that you can protect yourself against rising prices when purchasing a commodity, but you are not locked into a price if prices fall. For this right but not obligation to be in the futures market, you pay what is called a premium.

All of these alternatives are available to you today. They can be used to help you manage your price risk and perhaps improve your chances of meeting your business goals. In comparing your marketing opportunities it is important to consider transportation costs, shrink, market charges or fees, marketing services available, methods of selling available, competitiveness of the market you are considering, price risk and marketing or pricing goals. If you take the time to get out of a marketing rut, you can compare these alternatives and shop for good pricing opportunities rather than waiting until weaning or coming off pasture to make a sale. Just take a little time to develop a marketing plan.

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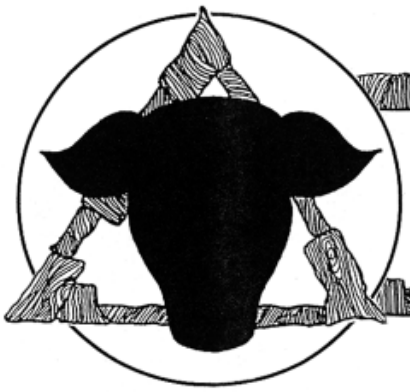

Comparing Your Marketing Opportunities

***By
Chris Bastian, University of Wyoming***

The three management areas causing risk and uncertainty are production, marketing and financial. This article will discuss the advantages and disadvantages of the alternatives discussed in "Marketing Alternatives That Can Be Considered In Your Business Plan Today" and how they affect your ability to manage price risk.

Why Manage Risk?

There are three general and perhaps related reasons why a manager would be interested in taking steps to reduce risk and uncertainty. The first is to reduce the variability of income over time. This allows more accurate planning for items such as debt payment, family living expenses, and business growth. Second, there may be a need to ensure some minimum income level to meet family living expenses and other fixed expenses. A third reason for minimizing risk is to enhance the survival of the business. Several consecutive years of low income may threaten business survival or result in bankruptcy. Some recent studies show many managers rate business survival as their most important goal. They are willing to accept a lower expected income if it reduces income variability and hence the risk of business failure.

Auctions

Advantages & Disadvantages

The price at delivery marketing alternative has some advantages. It is usually very easy and typically a familiar alternative for producers. Just deliver the commodity and take the price determined by the auction or offered at the elevator. Producers receive payment almost immediately after the commodity is sold. Producers also have great flexibility in the quantity they sell. Some alternatives such as futures contracts may specify a certain amount of product to be sold at one time. In the case of the auction, the market is considered to be price efficient. Price efficiency is concerned with how accurately, how effectively, how rapidly, and how freely the marketing system makes prices which measure product values to the ultimate consumer and reflects those values through the marketing system to the producer.

Unfortunately, from a risk management standpoint the price at delivery strategy increases price risk. In fact, the price at delivery alternative maximizes a producer's price risk. Producers can only control when they take the commodity to market, but they still accept the price given them at the time of delivery. Ultimately, this strategy can compound with production risks to increase income variability for the firm.

Forward Contracts

Advantages & Disadvantages

If you forward price all of your expected production through forward contracts you can minimize

your price risk. However, you must recognize that there are some risks of non-performance associated with this method. There are some measures you can take to reduce those risks. Forward contracts offer you the advantages of being relatively easy, flexible in quantity and reducing your price risk.

Some of the disadvantages include risk of non-performance, not being able to capture higher prices once the contract is signed, and it is not very price efficient. Before signing on the dotted line and agreeing to the buyer's price, check around with other buyers and your neighbors to make sure this price is reasonable. Also, check other marketing alternatives which you might use to forward price your production to see if this is a good pricing opportunity.

Video Auctions

Advantages & Disadvantages

Some of the obvious advantages of this marketing alternative are the cattle are handled less, cattle remain on the place until sold and more competitive bids can be obtained than by just forward contracting with one buyer. The seller can determine desired delivery date. The forward price of the video auction reduces price risk. The video auction provides valuable services unavailable when negotiating a forward contract with a single buyer. For example, the auction guarantees buyer performance of the contract. The seller can also decide to no sale the cattle and faces less transportation costs than with the local auction or perhaps the forward contract alternative.

As in the case of forward contracting, one of the disadvantages of the video auction is that once the seller accepts the bid, he or she cannot benefit from price rises in the market for those cattle committed to the video sale. The video auction does have higher commission fees associated with it, but the transportation costs are typically less. Discounts are incurred for less than a full truckload of cattle. Length of time between videotaping of the cattle and the sale is sometimes a disadvantage. Frequency of video sales is less than that of regular auctions.

Hedging with Futures

Advantages & Disadvantages

The futures market offers the producer the opportunity to forward price his or her commodity. It also allows the producer the flexibility to forward price without negotiating a contract with a buyer. Thus, the producer can forward price production up to twelve months in advance and reduce price risk.

There are some disadvantages to using the futures market as well. In order to trade on the futures market a producer must get a broker and set up what is called a margin account. The margin account is used to cover losses on the futures position. In the case of a short hedge if prices rise above the price you get in, your account loses money, and you may have to deposit money with the broker for your margin account. The important thing to remember is that if the futures market is rising, the cash market is likely also rising. So remember, even though you may be losing in the futures market you may be gaining in the cash market.

Just as in the case of forward contracting, the producer cannot benefit from favorable cash prices because the futures hedge has locked in a price subject to basis risk. Additionally, the producer must pay a broker a commission fee for handling his market actions in the futures market. This is an added cost the producer must account for when comparing expected prices from different marketing alternatives. An additional cost to using this alternative would be interest costs associated with money borrowed to use in the margin account. Another possible disadvantage of using the futures market is that the contracts are standardized as to quantity. This reduces some of the quantity flexibility producers have with privately negotiated forward contracts. Overall, hedging in the futures market is more complex and requires more time managing its use as an alternative. However, hedging in the futures market is still a very valuable price risk management alternative.

Agricultural Options

Advantages & Disadvantages

The options market offers some real advantages compared to forward contracts and the futures market. You are able to reduce price risk without facing margin calls in the futures market. Also, you are able to benefit from rising prices as you are not locked in if the market trends favorably. The options market also offers many different strike prices or levels of price insurance.

The options market's advantages do not come without some disadvantages either. You pay a higher price for the insurance through the premium with this alternative than you would with just forward contracting or hedging in the futures market. Additionally, you pay a commission fee to a broker for executing your transactions in the options market. The commis-

sion fee is typically less for options transactions than futures transactions, however. As was the case with the futures market, the options market deals with standardized contracts and there are set quantities which reduces the flexibility for producers. Also, producers are subject to basis risk with this alternative just as in the futures market hedge.

Comparing Alternatives

Risk

These two articles, "Marketing Alternatives That Can Be Considered In Your Business Plan Today," and "Comparing Your Marketing Opportunities" focused on marketing alternatives, considerations using the alternatives, their pros and cons and their relationship to price risk. Price at delivery, i.e. just delivering your cattle to the auction barn and accepting the price offered, is an alternative which maximizes your price risk and increases your income variability. Forward contracting is a way to reduce your risk, but it also reduces your ability to capture gains from rising prices at a future point in time. Certain conditions should be written explicitly in the contract itself to reduce the risk of non-performance.

Video auctions for cattle are also a form of forward contracting except the cattle are videotaped and displayed to a number of buyers. This allows the producer an opportunity to expose the cattle to more buyers and perhaps get a more competitive price. The cattle are forward priced, reducing the price risk, but the cattle cannot be sold for a higher price at a future point in time if the cash market trends upward. The video auction also is responsible for contract performance by both parties. Hedging in the futures market offers an opportunity for producers to reduce price risk. This alternative is more complex, and requires margin deposits which are a disadvantage. The producer trades price risk for basis risk with this alternative. Using options is another way a producer can reduce price risk. Put options can be used to set a minimum price for a commodity, but the producer can take advantage of price rises with this alternative. Call options can be used to set a maximum purchase price for a commodity, but the producer can take advantage of falling prices with this alternative. Options offer some advantages over the futures market, but the option premium is the price you pay for those advantages. Producers are still subject to basis risk with options.

Costs

When comparing these alternatives producers need to consider all the costs involved with each of these. Costs associated with the cash market include transportation, shrinkage, commission and yardage fees, checkoff and inspection fees. Some of the costs associated with the forward contract alternative are negotiated into the contract, but in general, transportation, shrinkage and any quality inspection costs need to be considered. The major costs associated with the video auctions include a videotaping fee, commission fees, shrinkage and a sliding scale price if weight specifications aren't met. The commission fees tend to be higher with a video auction than a cash auction, but some of that cost may be offset with less transportation costs and less shrinkage costs depending on the individual's proximity to a cash auction and weighing facilities. Additional costs associated with the futures market include commission fees to the broker and interest on margin funds. Additional costs associated with options include premiums, broker fees and interest on borrowed premium funds.

In addition to deciding which alternative to use, livestock producers must decide when to deliver livestock and when to price livestock. When developing a marketing plan compare your marketing alternatives based on risk, costs and actual price after marketing costs, but also consider your price goals. These price goals should be set forth in your market plan and will give you the opportunity to decide whether you have good pricing opportunities throughout the year. The article entitled "Market Plan" goes into more detail as to how to develop a marketing plan, but it is important to remember with a little planning your marketing can take place throughout the year and allow you to take advantage of good opportunities rather than waiting for the price available after coming off pasture.

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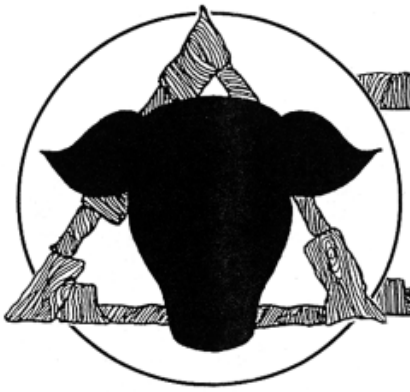

Managing for Today's Cattle Market and Beyond

Futures Market - Basic

By
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Cattle producers face a great deal of risk, not only in production but also in pricing. One technique which can be used to manage the price risk is the futures market. The focus of this article is on the basic concepts and definitions related to that market. Other articles will be provided for other pricing techniques.

The Chicago Mercantile Exchange

The Chicago Mercantile Exchange (CME) was established in 1919. It is the primary livestock exchange. Cattle futures, both live (fed) and feeder cattle, are a part of the CME.

While anyone can buy or sell futures, all transactions for cattle are handled by a broker who then uses appropriate channels to carry out orders. Again, for livestock, the CME is a major player in those channels.

Futures Contract

A futures contract is a standardized agreement to buy or sell a commodity at a date in the future. It is an obligation. The contract specifies the commodity (live cattle, feeder cattle), the product quantity (40,000 or 50,000 pounds of live animals), product quality (specific U.S. grades and yields), delivery points (only for live cattle--there are no delivery points for feeder cattle), and the delivery date (within the month that a contract terminates).

The important concept to remember here is that the contract is standardized. Product descriptions are pre-set. If what you produce is different than the product described in the contract, the price quoted for the futures contract must be adjusted. That adjustment process involves basis. Both the process and basis are discussed later.

Who Uses Futures

There are three major categories of people who use futures: hedgers, speculators and observers. The hedger uses the futures market to manage price risk for products they have or expect to have. Risk is transferred to the speculator. The speculator accepts the risk with the anticipation of earning a profit. Speculators have no intentions of buying or selling actual commodities. The observer does not actively participate in the futures market (doesn't buy or sell futures) but uses the information provided in the futures market. Possible uses include establishing price outlook and evaluating other pricing alternatives.

What is Hedging?

Hedging is buying or selling futures contracts as a protection against unfavorable price changes. A short, or selling hedge, is used when you plan to sell a commodity, such as a rancher with feeder cattle, at

some future date. You are concerned that prices will fall. A long, or buying hedge, is used when you plan to buy a commodity, such as a feedlot needing feeder cattle, at a later date. You are concerned that prices will increase.

In either case (short or long), the key is the use of "opposite" transactions. All that means is that as you are producing a product (feeder cattle), you are buying that product as you pay for inputs. An opposite transaction on the futures market would be to sell futures. Then, when the feeder cattle are sold, do the opposite on the futures market (buy back the contract originally sold).

The transaction of buying back a futures contract originally sold is called "offsetting". All transactions are made through a broker. That individual should be able to help those who are "in it for the first time".

Basis

As noted earlier, commodities are very specifically defined in futures contracts. In many cases, producers do not produce exactly that product. Or, there may be locational differences between where the real or actual product is located and a delivery point (or in feeder cattle, between your product and the U.S. average price). The relationship between the futures market price and your cash price is called basis. In formula terms, it is:

Basis = Cash Price - Futures Price

The difficulty with basis is not computing it "after the fact". The problem is encountered when basis must be estimated "ahead of time". For example, assume that in May the futures price for feeder cattle for the month of November is $62.00. That $62.00 price refers only to the product described in the contract. What does it mean to you? A basis adjustment must be made. Since we don't know now exactly what the difference between our cash price in November and the November futures price in November will be, we must estimate that difference now. In effect, our expected price for November is:

Expected Price = Futures Price ± Basis Adjustment

If we had assumed the basis to be -$1.00 (or we expect our cash price to be $1.00 below the futures price in November), our expected price would be:

$62.00 - $1.00 = $61.00

The actual net price received in November will equal the expected price only when basis is estimated correctly. There is more discussion on basis in another article. It should be noted here that basis is one of the most critical concepts in the use of the futures market. If basis cannot be estimated with a greater degree of accuracy than the cash price, then the futures market cannot be used to shift price risk.

Broker and Orders

As noted earlier, you must go through a broker to use the futures market as an active participant. Brokers carry out the orders of hedgers. Those orders are of several types. The two most common types are: (1) market order -- an order for the sale or purchase of a futures contract to be filled as soon as possible at the best possible price, and (2) price (limit) order -- an order for the sale or purchase of a futures contract only at a certain price or better. Market orders usually are filled very quickly. Price orders will not be filled unless the price selected is reached -- sometimes never.

Margin Money

Margin money (sometimes referred to as performance bond) is in effect "good faith money". A certain amount (initial margin) is required before trading is begun. If the market "moves against you" (example--prices move up after you sold a futures contract), more margin money may be required. It is important to work with your broker, lender, spouse and partner regarding the margin account.

How Does a Short Hedge Work?

An example using a short (selling) hedge may help clear up some questions. A short hedge is presented because it is the type most often used by someone producing a product to be sold at a later date. A long hedge example will not be presented here because of space limitations. The procedures used in a long hedge are similar to those used in a short hedge.

Assume you are a producer of Spring born feeder calves which you plan to sell at 600 pounds the following Fall. Assume you have enough calves for one feeder cattle contract (50,000 pounds or about 83 head of 600 pound calves). You note the feeder cattle futures market for November (when you plan to sell the calves) is trading today (assume it is May) at $62.00. Since you produce top quality calves and sell in a good market, you assume that your 600 pound calves will bring a price about $2.00 above the national average price (the price used to cash settle the feeder cattle futures contract) for 700-800 pound top-of-the-line medium frame number one steers (the product described in the feeder cattle futures contract). The $2.00 premium is your estimated basis and means

you have an expected price of:

$62.00 + $2.00 = $64.00
Futures Price | Basis | Expected Price

If the above price is acceptable, call your broker (assume an account already has been established and margin money has been deposited) and "sell" a November feeder cattle futures contract for $62.00 (note here that your order may take several forms, including a specific price where a sale will occur only if that price is reached or a market order when a sale will take place at the "going rate".

Assume that a November feeder cattle futures contract has been sold at $62.00 on May 1. Now, move forward in time to November. The calves are ready to sell. The opposite position to the cash sales now would be to buy back the November futures you sold in May.

If Prices Had Moved Higher

The following table can be used to show the results if prices move higher and it is assumed that our basis estimation of +$2.00 is correct.

	Cash Side		***Futures Side***
On May 1	Raise calves		Sell Nov Futures $62.00
	Futures Price	$62.00	
	Basis Adjust	+ 2.00	
	Expected Price	$64.00	
In Nov	Sell Calves	$70.00	Buy Nov Futures $68.00
			Futures results = -6.00
Net	$70.00 - 6.00	= $64.00 actual net price	
	Cash result	Futures	

Since the basis estimation of $2.00 was the actual basis, our actual net price was the same as we expected ($64.00). Of course, the neighbor who did not hedge received $70 for his/her calves. This should not concern you -- you got what you expected.

If Prices had Moved Lower

Prices don't always move higher after a producer sells a futures contract. They often move lower. The following table can be used to show the results if prices moved lower (again, assume the basis estimate was correct).

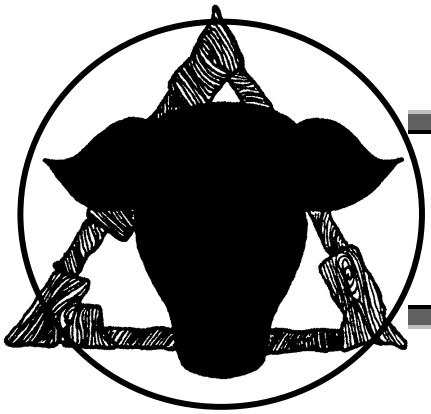
Here, the neighbor who did not hedge would have received only $55.00 for his/her calves. You should be happy -- not because you beat the neighbor but because you got what you expected.

	Cash Side		***Futures Side***	
On May 1	Raise calves		Sell Nov futures	$62.00
	Futures Price	$62.00		
	Basis Adjust	+ 2.00		
	Expected Price	$64.00		
In Nov	Sell Calves	$55.00	Buy Nov Futures	$53.00
			Futures results	+ 9.00
Net	$55.00 + 9.00 = $64.00 actual net price			
	Cash gain	Futures		

Final Comments

The futures market is not for everyone. It is a pricing alternative that sets both a maximum and minimum expected price. If either eliminating the "price upside" or payment of margin money is not acceptable, this is not the tool for you. The concepts discussed earlier are critical. First is the rule of opposite -- you must be on opposite sides of the cash and futures market. Second, it is critical that basis can be estimated with some degree of accuracy. Finally, hedgers must have a mind-set that says "I got what I expected, therefore I am satisfied" -- even if without hedging you could have done better or the neighbor gets a better price.

The futures market can be a valuable tool to the observer. Observers can use their knowledge of the futures market and basis to evaluate other pricing alternatives, such as a cash forward contract. In effect, a cash forward contract is possible because of the futures market. Prices offered in cash forward contracts usually are based upon the futures market.



Managing for Today's Cattle Market and Beyond

March 2002

Hedging Using Livestock Futures

By
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Livestock producers are sometimes faced with advantageous pricing opportunities prior to the time grain or livestock will be bought or sold in the cash market. In these situations producers can forward contract in the cash market to establish sale or purchase prices. However, forward contracts require that delivery of the exact quantity and grade contracted be made during the specified time frame to satisfy the contract.

Given the uncertainty associated with agricultural production, a more flexible alternative to forward contracting is sometimes desired. One alternative is to use futures markets to establish an expected sale or purchase price. A short hedge, where the sale of a futures contract is substituted for sale of the cash commodity, can be used to protect against a price decline. Conversely, a long hedge, where the purchase of a futures contract is substituted for the purchase of the cash commodity, can protect input purchasers from the risk that prices will increase prior to purchase of the input in the cash market.

What Is a Hedge?

Hedging is the use of the futures market as a temporary substitute for an intended cash market transaction, which will take place, in the cash market, at a later date. For example, a cattle feeder interested in establishing an expected sale price on a pen of slaughter cattle would initiate a short hedge by selling live cattle futures. The live cattle futures sale serves as a temporary substitute for the cash market sale, which will take place when the cattle are ready for slaughter. Later, after the cattle have been sold in the cash market (and the cattle feeder no longer needs a temporary substitute for the cash market transaction), the initial sale of the live cattle futures contract is offset by issuing an order to buy the exact same futures contract. The clearinghouse at the futures exchange recognizes that the initial sale has been "offset" by the subsequent futures contract purchase, resulting in the cattle feeders' exit from the live cattle futures market. To determine the *Actual Sale Price* for the cattle, the cattle feeder should take the revenue received from the cash market sale and add the gain, or subtract the loss, that occurred on the futures transaction.

Five steps are key to implementing a hedge that will likely meet your pricing objectives.

1. Understand basis and develop a basis forecast. Basis is the difference (cash price minus futures price) between the local cash price and the futures contract's price. Prior to initiating a hedge, it's important to develop a basis forecast for the approximate date when the cash market transaction will occur. Historical basis data for the time of year and the cash market where the transaction will take place can be used to generate a basis forecast. Once a basis forecast has been generated, it's possible to calculate your *Expected Sale Price* or *Expected Purchase*

Price by adding the basis forecast value to the futures price at which the hedge is initiated. Calculating your expected price is important because it allows you to anticipate what you will receive (or pay), net of any gain or loss in the futures market. Failure to account for basis and basis risk mean you will have difficulty meeting your pricing goals. A more complete discussion of basis is provided in another article in this series.

2. Be sure you have correctly identified the number of contracts required for your hedge. For example, assume a cattle feeder has 101 head of steers on feed that have a projected sale weight of 1200 lbs. and an expected death loss of 1 percent. The number of head on feed, times one minus the death loss, times the projected sale weight per head, yields the expected total pounds of slaughter cattle that will be produced. Divide this total by the Chicago Mercantile Exchange (CME) Live Cattle contract weight specification (40,000 pounds/contract) to obtain the number of contracts necessary to fully hedge the pen. In this example, 101 head X (1-.01) X 1200 lbs/head divided by 40,000 lbs/contract equals 3 contracts. Note that when performing this calculation, the result will rarely be an exact integer and the hedger will have to decide whether to be somewhat over or under-hedged.
3. Select the proper futures contract month. Project the date of the anticipated cash market transaction and select the first futures contract month that is scheduled to expire after your expected cash market transaction. Using the futures contract that is closest to expiration when you make your cash market transaction will, generally, allow you to forecast basis (the difference between cash and futures prices) more reliably. For example, an expected December feeder cattle sale would be hedged using January CME feeder cattle futures, since the January contract is the contract closest to expiration during December, when the cash market transaction will take place.
4. Offset your hedge when the cash market transaction takes place. A hedge is a temporary substitute for an intended cash market transaction. As a result, hedges should be offset when the intended cash market transaction has occurred. In the case of a short hedge, the futures position would be offset by issuing an order to buy the exact same futures contract that was originally sold at the outset of the hedge. Conversely, in the case of a long hedge, the futures position would be offset by issuing an order to sell the exact same futures contract that was originally purchased at the outset of the hedge. Keeping futures positions open after the cash market transaction has taken place is speculating, not hedging, since the futures position is no longer being used as a temporary substitute for an intended cash market transaction. Finally, after a hedge position is initiated in the futures market, the futures position should not be offset prior to the cash market transaction without careful consideration of the resulting risk exposure.
5. Develop your own guidelines to help you determine when to eliminate some of your price risk exposure by hedging and when to remain exposed to price risk by not hedging or forward pricing. Deciding when and at what price level to initiate a hedge is the most difficult aspect of hedging for many people. There are no hard and fast rules that will enable you to routinely identify the best time and price level to place a hedge. One recommendation is to consider how much price risk you can safely absorb, continually monitor price and potential profit levels, and place a hedge when you decide the potential risk of adverse price movement outweighs the potential gain associated with a favorable price change. Finally, don't fall into the trap of always holding out for what you have identified as an "acceptable profit". In fact, it's important to recognize that, in some market situations, protecting an acceptable profit may not be possible. Prudent managers also consider using a hedge to limit losses when market conditions dictate.

How Does a Short Hedge Work?

Since the short hedger is using the futures market as a temporary substitute for an intended cash market sale, he will initiate a short hedge by selling one or more futures contracts. If futures and cash prices decrease while the short hedge is in place, the lower cash price the producer receives for his production is offset by a gain from the futures market transaction. Conversely, if prices increase

following initiation of the short hedge, losses incurred on the futures market trade will offset the cash price increase.

An accurate basis forecast is vital. If projected basis and actual basis are the same, then the *Expected Sale Price* that was calculated when the hedge was initiated will equal the *Actual Sale Price* (i.e., cash price net of any gains or losses in the futures market) at the hedge's conclusion. In reality, projected and actual basis levels will rarely be exactly equal, but successful hedging requires that you be able to forecast basis reliably. The scenarios addressed in the example will further illustrate the mechanics of this price risk management tool.

Case Example: Short Hedge for Feeder Cattle

Bill grazes steers on winter wheat pasture in the southern Great Plains. For the coming winter, he plans on turning 165 head of 420 lb steers out on November 1 and grazing them until March 1 (four months). For the past ten years, his steers have gained an average of 1.5 lbs per day and his death loss has averaged 1 percent. Bill anticipates his cattle will weigh approximately 600 lbs when he pulls them off wheat and sells them. Further, he projects a breakeven sale price of $78/cwt for the steers.

In early November, Bill notices the March CME feeder cattle futures contract is trading at $85/cwt. Further, Bill knows the historical basis for feeder cattle in his area is -$1/cwt relative to futures in early March (i.e., cash price is generally $1/cwt below the March feeder cattle futures price). Based upon his basis forecast, he determines that if he initiated a short hedge at $85/cwt his *Expected Sale Price* on March 1 would be $84/cwt ($85 - $1), which is acceptable to him. Because Bill fears a possible price decline while the calves are grazing wheat, he elects to initiate a short hedge in November to price the steers he plans on selling in March. Since each feeder cattle futures contracts is for 50,000 lbs, Bill opts to sell 2 contracts to cover his expected cash market sale of 98,010 pounds (165 X (1-.01) X 600).

	Cash Market	Futures Market	Basis
November 5	Objective: to realize a sale price of $84/cwt for his feeder steers	Sells 2 CME March feeder cattle contracts at $85/cwt	Projected at -$1/cwt
March 3	Sells 164 head of 600 lb feeder steers for $79/cwt	Buys 2 CME March feeder cattle contracts at $80/cwt	Actual basis, -$1/cwt ($79 - $80)
	Gain or loss in Futures =	*Gain* of $5/cwt ($85 - $80) Times 1000 cwt. = $5,000	

Results:

Cash Receipts 164 X 600/100 X $79.00 = $77,736
Futures Market Loss + $ 5,000
Net Receipts $82,736*

Actual Sale Price =
$82,736/ (164 X 600/100) = $84.08/cwt*

* Excluding brokerage commissions and interest.

How Did the Feeder Cattle Short Hedge Work?

Bill projected an early March sale price of $84/cwt on November 5. On March 3, he sold 164 (death loss was 1 head or 0.6%) head of feeder steers for $79/cwt in his local cash market and liquidated his futures position. The decrease in steer prices he had feared occurred, and the cash price he received for his calves was less than his projection. However, Bill realized a profit of approximately $5/cwt profit from the decrease in the CME March feeder cattle futures price. Adding this gain to his cash market receipts, resulted in Bill's *Actual Sale Price* equaling $84.08/cwt., virtually identical to the $84/cwt. he projected.

The *Expected Sale Price* and *Actual Sale Price* were virtually identical because Bill's basis forecast was accurate. A favorable basis move (i.e., a more positive basis) would have resulted in a higher *Actual Sale Price*, whereas an unfavorable basis move (i.e. a more negative basis than expected) would have resulted in a lower *Actual Sale Price*. This serves to highlight the fact that, once the initial futures position has been established, the hedger is no longer exposed to the risk that futures prices will go up or down since the hedger has effectively "locked in" the futures prices. However, hedgers are still exposed to basis risk since basis is not established until the cash market transaction takes place.

What If Bill's Price Outlook Was Incorrect?

Let's examine the effects of a price increase on the performance of Bill's feeder cattle short hedge.

	Cash Market	Futures Market	Basis
November 5	Objective: to realize a sale price of $84/cwt for his feeder steers	Sells 2 CME March feeder cattle contracts at $85/cwt	Projected at -$1/cwt
March 3	Sells 164 head of 600 lb feeder steers for $89/cwt	Buys 2 CME March feeder cattle contracts at $90/cwt	Actual basis, -$1/cwt ($89 - $90)
	Gain or loss in Futures =	*Loss* of $5/cwt ($85 - $90) Times 1000 cwt. = $5,000	

Results:

Cash Receipts 164 X 600/100 X $89.00 = $87,576
Futures Market Loss + $ 5,000
Net Receipts $82,576*

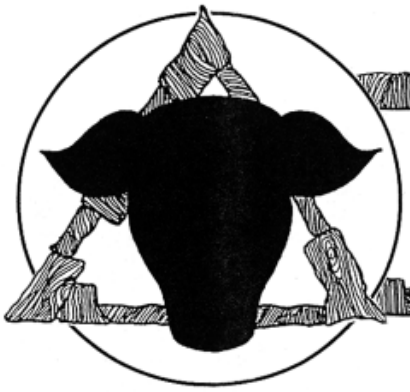
Actual Sale Price =
$82,576/ (164 X 600/100) = $83.92/cwt*

* Without commission and interest.

Bill's pricing objective of $84/cwt was essentially achieved for the feeder steers that he hedged in November. The difference between the *Expected Sale Price* of $84 and the *Actual Sale Price* of $83.92/cwt is attributable to the fact that he was slightly over hedged (i.e., his futures market position of 100,000 pounds was slightly larger than his actual cash market position of 98,400 pounds). Note that futures prices rising or falling after Bill initiated his hedge had no significant impact on his *Actual Sale Price* since he effectively "locked in" the futures price once he sold the March feeder cattle futures contracts in November.

Advantages and Disadvantages of a Short Futures Hedge

Advantages	Disadvantages
1. Protects against risk of price declines	1. Do not participate in gains from future price increases
2. Could make it easier to obtain credit	2. Success dependent on ability to accurately forecast basis
3. Easier to implement and cancel than a forward contract arrangement	3. Futures contract quantity is standardized and may not match cash market quantity
	4. Futures position requires a margin deposit and margin calls are possible



Managing for Today's Cattle Market and Beyond

Commodity Options as Price Insurance for Cattlemen

By
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Most cattlemen are familiar with insurance, insuring their buildings against fire, their equipment against accidents, and their lives against death or injury. Insurance trades a small but certain loss, the insurance premium, for the possibility of a large but uncertain loss.

In cattle production, one of the greatest risks faced is that of unfavorable price change. Prices for cattle have been so uncertain that many times prices that were expected to be profitable - when decisions were made regarding facility investment, breeding or feeder cattle purchases - ended up unprofitable instead. Additional risk may also be incurred on the feeding side as unfavorable grain price increases may "wipe away" anticipated profits.

Because of these risks, producers might want to "insure" feeder cattle, fed cattle or feed against unfavorable price movements, while still being able to take advantage of favorable prices. Cattlemen have this opportunity by using the commodity options market.

What is the Commodity Options Market?

The commodity options market is simply a market in which producers may purchase the opportunity to sell or buy a commodity at a specified price. Purchasers in these options markets have the "opportunity" but not the "obligation" to exercise their agreement. Therefore, the markets are appropriately named "options markets" since they deal in an option, not an obligation.

Just as cattlemen may purchase the right from an insurance firm to collect on a policy if their buildings burn, they can purchase the right to sell commodities at a specific price in case prices drop below the specified price. A separate market exists to purchase the right to buy commodities at a specified price in case prices move higher.

For instance, if one desired to buy the right to sell feeder cattle for $65/cwt., the feeder cattle options market might provide the opportunity. By paying the market determined premium, one could then collect on the option if prices are below $65/cwt. when the cattle were actually sold. If prices are higher than $65/cwt., the cattle are sold for the higher price, and the cost of the premium is absorbed.

While this is a simplified version of the actual way in which producers operate in the options market, the concept is a very simple one. Just as with other types of insurance, by paying a premium, insurance can be purchased against price declines or increases. One could collect on the option only if the price moves in an unfavorable direction.

The "In's and "Out's" of Options Puts and Calls

As mentioned, there are actually two types of

commodity options: a *call option* and a *put option.* The call option gives the holder the right, but not the obligation, to buy the underlying commodity from the option writer at a specified price on or before the option expiration date. The put option gives the holder the right, but not the obligation, to sell the underlying commodity to the option writer at a specified price on or before the commodity expiration date. The call option and the put option are two distinct contracts. A put option is not the opposite side of a call option. Distinguish the two types of options by remembering that the holder of the put option can choose to "put-it-to-them" that is, sell the product, while the holder of the call option can "call-upon-em" to provide the product.

Buyers and Sellers

In the option market, as in every other market, transactions require both buyers and sellers. The buyer of an option is referred to as an option holder. Holders of options may be either seekers of price insurance or speculators.

The seller of an option is sometimes referred to as an option writer. The seller may also be either a speculator or one who desires partial price protection. Whether one chooses to buy (hold) or sell (write) an option depends primarily upon one's objectives.

Buyers and sellers of cattle options "meet" on the Chicago Mercantile Exchange. Rather than physically meeting, all transactions are carried out through brokerage firms which act as the buyer and seller representative at the exchange. For this service, the brokerage firm charges a commission. The exchange has no part in the transaction other than to insure its financial integrity. In effect, the exchange offers a place for option buyers and sellers to get together under organized rules of trade.

Strike Price

The "specified" price" in the option is referred to as the exercise price or strike price. This is the price at which the underlying commodity can be exchanged and is fixed for any given option, put or call. There will be several options with different strike prices traded during any period of time. If the price of the underlying commodity changes over time, then additional strike prices may be traded.

Underlying Commodity

The "underlying commodity" for the commodity option is not the commodity itself but rather a futures contract for that commodity. For example, an October feeder cattle option is an option to obtain an October feeder cattle futures contract. In this sense the options are on futures and not on the physical commodity.

Because options have futures contracts as their underlying commodity, each option contract "stands" for the same quantity as the underlying futures contract. That is, most grain options represent 5,000 bushels, while the live cattle option represents 40,000 pounds of fed cattle. The feeder cattle option represents 50,000 pounds of feeder cattle. Options are traded for each of the futures contact months in each of these commodities.

Expiration

Futures contracts have a definite predetermined maturity date during the delivery month. Likewise, options have a date at which they mature and expire. The specific date of expiration for the feeder cattle option contract is the same as its underlying futures contract - about the 20th of the month.

The fed cattle option contract expires the first of the futures contract month, prior to the futures contract expiration around the 20th of the month. For example, a $65/cwt. October fed cattle put option is an opportunity to sell one October live cattle futures contract at $65/cwt. This option can be executed by the holder on any business day until the first week in October.

Option Premiums

The put or call option writer is willing to incur an obligation in return for some compensation. The compensation is called the option premium. Using the insurance analogy, a premium is paid on an insurance policy to gain the coverage it provides, an option premium is paid to gain the rights granted in the option. The premium is determined by public outcry and acceptance in an exchange trading pit, and like all commodity prices, it can be expected to change daily.

While the interaction of supply and demand for options will ultimately determine the option premium, two major factors will interact to affect the level of premiums. The first factor is the difference between the strike price of the option and the price of the underlying commodity.

This differential in prices may give the option

"intrinsic" value. For example, consider an October feeder cattle put option with a strike price of $60/cwt. and the underlying October feeder cattle futures with a current price of $58/cwt. The option could be sold for at least $2/cwt. since others would be willing to purchase the right to sell at $60 when the market is currently $58. This $2 is said to be the intrinsic value. As long as the market price on the option's underlying futures contract is below the strike price on a put option, the option has intrinsic value. Of course, the converse of the price relationship is true for a call option. A call option has intrinsic value when the market price is above the strike price.

Any option that has intrinsic value is said to be "in-the-money". An "in-the-money" option has value to others because the market price is below the put or above the call strike price. An option is said to be "out-of-the-money" and has no intrinsic value if the current market price is above the put or below the call strike price. When the market price of the commodity and the strike price are equal, the option is said to be "at-the-money," and will have no intrinsic value.

A second factor that will influence the option premium is the length of time to expiration of the option. Assuming all else is held constant, option premiums will usually decline in value as the time to expiration decreases. This phenomenon reflects the time value of an option. For example, in August the time premium on a $60 September feeder cattle option will be less than the premium on a $60 November option. The option with a longer time to expiration has a greater probability of moving "in-the-money" than the option with less time. Therefore, it is worth more on that factor alone. The longer the time period, the greater the chance that events will occur that could cause substantial movement in futures prices and change the value of the option. As a result, the option writer requires a greater premium to assume the risk of writing a longer term option.

"Out-of-money" options have a value that reflects time value. "In-the-money" options possess both time value and intrinsic value.

Offsetting An Option

The method by which most holders of "in-the-money" options will realize any accrued profit is by resale of the option. This is referred to as "offsetting" an option position. Options can be offset anytime between their purchase and expiration date if the holder so desires. Most option buyers will offset their position rather than exercise the option to avoid losing any remaining time premium and (or) assuming a futures market position and its resultant decisions, margin deposits, and commissions. In most situations, the option can be resold to another trader at a premium at least equivalent to the intrinsic value that results from an "in-the-money" price relationship.

Exercising an Option

Another method by which the holder of an option could realize accrued profit is by "exercising" the option. The decision to exercise an option lies only with the holder. The opportunity to exercise the option means the option buyer can always get the intrinsic value of the option premium even if there is little or no trading in the option being held. It also provides for a means of continuing price protection after the option expires. If the decision is made to exercise, the following procedures are followed. For a put, the holder is assigned a short (sell) position in the futures market equal to the strike price. At the same time, the option grantor is assigned a long (buy) futures position at the same price. Both positions are then adjusted to reflect the current settlement price. It is rational to exercise a put option only when the futures market price is below the strike price so that the holders futures position will show a profit. The futures position of the grantor will show an equivalent loss. At this point the option contract has been fulfilled and both parties are free to trade their futures contracts as they see fit.

Evaluating and Using Options Markets

Now that the mechanics of options trading has been explored, it is time to consider two critical questions. (1) What do varying strike prices mean in terms of price insurance? (2) How does a producer actually obtain this insurance?

There are three steps to consider in evaluating option prices. The first step is the selection of the appropriate option contract month. To do this, select the option whose underlying futures will expire closest to, but not before, the time the physical commodity will be sold or purchased. For example, if a group of feeder calves were to be sold in early October, the October option would be appropriate.

The second step is to select the appropriate type of option. To insure products for sale at a later time against price declines, then the producer would be interested in buying a put (the right to sell). If the producer's motive is to insure future commodity

purchases against cost increases (for instance corn needed to feed cattle), then the purchase of a call will be needed. To continue our example: if the cattleman wishes to insure the feeders he will be selling in early October, then he will be interested in purchasing an October put option.

The third step to consider in evaluating option prices is to calculate the minimum cash selling price (MSP) being offered by the put option selected. For a call option, the maximum buying price (MPP) would need to be calculated. These calculations can be accomplished in five steps.

1. Select a strike price within the option month. For instance, a $60 October feeder cattle put.
2. Subtract the premium from the strike price for a put or add the premium for a call. For the example, a $60 October put cost $2.75/cwt. So the result is $60.00 - 2.75 = $57.25/cwt.
3. Subtract (for a put) or add (for a call) the "opportunity cost" of paying the premium for the period it will be outstanding. For example, if the option premium of $2.75/cwt. is paid in June and the option is expected to be liquidated by an offsetting resale in early October, an interest cost for the three month period needs to be added. If borrowed funds are used and the interest rate is 12% (for example) then the cost would be 1% per month or 3% for 3 months. The interest cost associated with a $2.75/cwt. put option premium would be $0.08/cwt. This leaves a net price of $57.25 - $0.08 = $57.17/cwt.
4. Subtract (for a put) or add (for a call) the commission fee for both buying and offsetting the option. Assume the brokerage firm charges $75 per round turn for handling each option contract. The per cwt. commission fee would be $0.15 ($75 for 50,000 lbs.). The net price is now $57.17 - $.15 = $57.02/cwt.
5. One final adjustment must be made to these prices. The option strike price must be localized to reflect the difference between prices in the local markets where the cattle will sold or grains purchased, and the futures market price. This difference is called basis. The basis differs greatly for cattle at different weights, sex, and locations across the country. See the fact sheet on basis for some of the factors which affect cattle basis. Most state extension services have historical basis estimates for cattle and inputs that may be helpful in determining the appropriate basis.

By adjusting the option price for basis, a minimum selling price can now be obtained for a put or a maximum purchase price obtained for a call. For the example, if in early October, 600 lb. feeder steers normally bring 1.00 per cwt. more than the feeder cattle futures market, then the likely minimum local cash selling price of the option can be determined. The minimum local cash price becomes $57.02+ $1.00 = $58.02+. The plus references the fact that this is the minimum price expected from a cash sale projected by a purchased put option.

More or less price insurance can be purchased by buying options with different strike prices. To determine the minimum selling price suggested by each strike price, just repeat steps 1 through 5.

Options Arithmetic: An Example

Once the relevant options prices have been evaluated, the next question is how would the producer go about obtaining a certain level of price insurance. An example will help illustrate the total process. The cattleman who will be selling a load of feeder cattle in early October checks the options quotes in June and finds he could purchase an October feeder cattle option to sell (a put) at $60/cwt. for $2.75/cwt. To further localize this strike price, he adds $1.00/cwt. (basis) since he normally sells 600 lb. steer calves slightly higher in October than the October futures price. Commission and premium interest cost will be about $.25/cwt., so the $60 put would provide an expected minimum selling price of $60 + $1.00 - $2.75-$.25 or $58/cwt. By comparing this with his other pricing alternatives and his production cost, he decided that the purchase of this put would be an appropriate strategy for the 83 steers he plans to sell in October. He calls his broker and advises him that he wants to purchase one "$60 October feeder cattle put at $2.75." He then forwards a check for $1450 (500 cwt. X $2.75/cwt. plus $75 brokerage fee) to his broker.

As October approaches, one of these three things will happen. Either prices will stay relatively unchanged or rise above the option strike price making the option worthless, or fall making the producer's option valuable. Remember for a put option, if the current futures price is above the strike price, the option is said to be "out-of-the-money." If futures are below the strike price, it is "in-the-money."

First, assume the futures market prices in early October are $65/cwt. Thus, the option is "out-of-the-money." Since no one is willing to pay for an option to sell at $60/cwt when they could sell currently for $65/cwt., the option expires worthless. In this case, the cattleman sells the load of feeders and does not use the option. The net price would be the cash price received

less the net premium cost originally paid. Assuming the cattle brought $66/cwt., the actual net received would be $63/cwt. ($66 - $2.75 premium - $.25 commission & interest).

In this case, the insurance policy was not needed. "Fire didn't burn the barn down" and had this been known in advance the cattleman could have saved the premium. However, just as "fire" or other disasters can't be perfectly predicted, price movements can't be predicted with accuracy either. For this reason, the cattleman was willing to substitute the known loss (premium) for the possibility of a larger unknown loss.

What happens if the cattleman does need to collect on his option position? Assume the futures market price at the first of October is $55/cwt. In this case, the option to sell does have value because others are willing to purchase the right to sell at $60 when they are currently only able to sell at $55/cwt. Remember, this means the option is "in-the-money." One way to collect on an options policy (offset) is very much like collecting on insurance. Since the value of the loss is $5/cwt., the cattleman should be able to sell the option back for at least this amount. He calls his broker and tells him to sell the October put at $5 or better. This cancels the option, and the broker sends a check for $5 per cwt. X 500 cwt. or $2,500. Since he paid a premium of $2.75/cwt. plus the .25/cwt option trading cost, he really netted $2.00 on the option trade. The producer sells his calves for $56/cwt. and adds the $2.00/cwt. gained on the option market to get the net price of $58.00. Thus, the option is successful in assuring the minimum price when he bought the option in June. The actions in both markets are summarized in Table 1.

In this case "fire burnt the barn" and the producer was able to collect on his option (policy). Just as with insurance, he collects to the extent of his loss. In options terminology, we are talking about the strike price (face amount of policy) less the current futures price of feeder cattle.

A second way in which the "insurance" could have been recovered would be to exercise the option, converting it into a sell (short) position in the futures market. If the futures position were then immediately closed out with a purchased October futures (long), the $5/cwt. difference would be realized ($60 - $55 current futures) with only an additional commission for the futures purchase. Since fed cattle options expire before the underlying futures, this may be the route to completion of the options "insurance" if the cattle were not sold until after the option had expired. With feeder cattle, however, this is not a problem because the futures and options expire together.

Figure 1 summarizes the resulting net price from purchasing an October put for $2.75/cwt. with $.25/cwt. trading cost under several futures market prices in October and a realized +$1.00/cwt. basis. It also makes clear why put option purchases are sometimes referred to as "floor pricing".

Actually, the producer will not be able to judge in advance exactly what his basis will be when he sells the cattle. If the actual basis is better than anticipated, then the realized net price from the options will be higher by this amount. If the actual basis is worse than anticipated, then the realized net price from the options will be lower by this amount.

Buying More or Less Insurance

Figure 2 shows the results of buying more or less insurance than the $60 put offers. For instance a $64 put could have been purchased for $4.95/cwt. This would have provided a higher floor price but at the expense of giving up more of the upside potential. A $56 put would have cost only $1.35/cwt. but provided a floor of only $55.40/cwt. If the cattleman can accept the reduced coverage of the lower cost strike price, then he will give up less of any potential price increase. Its obvious from a comparison of each of the strategies that cattlemen should buy only as much insurance as needed.

Summary

Purchasing options for price insurance is a way cattlemen can use the options markets as a pricing alternative. This alternative should be carefully compared to all other pricing alternatives in light of the producer's objectives and risk bearing ability. Options purchased for price insurance provide a kind of "hybrid" market with characteristics of both doing nothing (cash market pricing) and hedging or forward contracting. That is, the producer who purchases an option for price insurance has some of the same price protection offered through a hedge or forward contracting. On the other hand, options are not as protective against unfavorable price movements as hedging or forward contracting, or as attractive as the open cash market if prices become more favorable. In fact, option purchases will always be, at best, second to either of the other two pricing alternatives when evaluated after the fact. However, cattlemen do not have the luxury of making pricing decision after-the-fact. Because of this, many cattlemen may find a place

in their pricing plans for the kind of "hybrid vigor" offered through the option market.

Table 1. Feeder Cattle Price Decline Example

Cash Market	Feeder Cattle Option Market
June 1	
Expect to sell 83 hd. in early October, Expected basis = +1.00 , So Expect minimum selling price of $58.00 (Strike price - premium & trade cost + basis)	Buy an October Feeder Cattle put option at a $60 strike price for $2.75 per cwt. Premium, trading cost $.25/cwt.
October 10	
Sell 83 hd. feeder steers locally @ $56.00/cwt.	October feeder cattle futures trading at $55. Sell $60 October put and collect $5 premium.
Results	
	Offset premium received - original premium & trading cost paid = $5 - $2.75 - $.25 = **$2.00**
Cash price + gain or loss in options market = actual price received OR $56 + $2 = **$58/cwt**.	

Figure 1. Possible outcomes when a $60 October put is purchased, +$1.00/ cwt. basis.

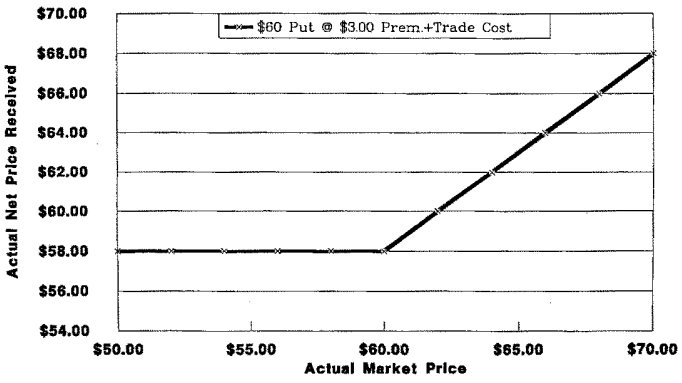
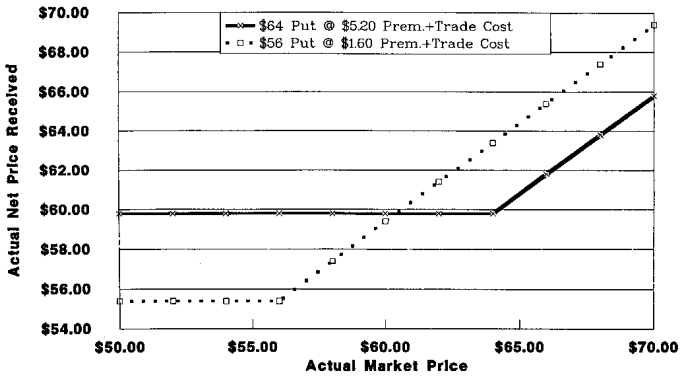


Figure 2. Possible outcomes from a $64 and $56 October feeder cattle put purchase, +$1.00/cwt. basis.



Managing for Today's Cattle Market and Beyond

March 2002

Understanding and Using Feeder and Slaughter Cattle Basis

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Basis is defined as the difference between the local cash market and a futures contract price (Basis = Cash Price - Futures Price). Knowledge of historical basis patterns can be useful when estimating expected sale or purchase prices at the conclusion of a futures or options hedge, when evaluating a current cash market quote, and when evaluating forecasted cash prices. This fact sheet explains how feeder and slaughter cattle basis is computed, outlines an approach to developing a history of local basis levels, and discusses how historical basis data can be used to forecast basis.

Introduction

A futures contract price represents today's opinion of a commodity's value at the time the futures contract expires. Moreover, the futures price quote is for a specific grade of the commodity at a particular location. Likewise, a commodity's local cash price represents the price at which buyers and sellers are willing to trade the commodity on a particular date at a given location. Thus, futures and cash prices on a given date can differ because they reflect differences in location, quality or time of delivery.

The difference between a commodity's futures contract and cash prices, for a particular grade at a specific location, is known as the basis. Basis is sometimes referred to as the price of a cash commodity at a particular location, relative to a specific futures contract, because it provides a measure of the local supply and demand conditions versus the aggregate supply and demand situation depicted by the futures contract's price.

Defining Basis

The formula for computing basis can be stated as:

Basis = Cash Price - Futures Price. (1)

The formula indicates that, if basis is negative, the futures price is greater than the cash price. Conversely, a positive basis indicates the futures price is less than the cash price.

Basis is usually computed using the nearby (closest to expiration) futures contract. For example, in October the nearby corn futures contract is the December futures contract and the December contract is generally used to compute basis for corn to be delivered in the fall. Similarly, in January the nearby

live cattle futures contract is the February contract since it is the contract closest to expiration.

Feeder and slaughter cattle basis are always computed using the nearby (closest to expiration) futures contract because it generally is not possible to store cattle into the expiration period of a subsequent futures contract. However, grain basis can be computed using a deferred futures contract price. A deferred futures contract is any futures contract farther away from expiration than the nearby futures contract. For example, in the fall you could choose to compute corn basis using the July corn futures contract, which is a deferred contract since the December contract is the nearby contract in the fall. It makes sense to do this with grains since they are a storable commodity, unlike cattle. Computing grain basis using a deferred futures contract makes it easier to evaluate expected changes in the basis over a long period of time, which can be helpful when evaluating storage profitability.

Basis is much easier to predict than either the cash or futures price. This is because most of the factors that influence a commodity's price affect both cash and futures prices simultaneously. Usually there is a one-to-one relationship (approximately) between cash and futures prices. This means that cash and futures prices tend to move together, i.e., if April live cattle futures prices go up by $1.00 per cwt., cash prices during April also tend to go up by about $1.00 per cwt.

Using Basis Information

The mathematical formula used to compute basis is a powerful tool. If we rearrange equation (1) and solve for the cash price we discover the following relationship:

Cash Price = Basis + Futures Price. (2)

Hedgers can use expected basis for the time frame when they expect to deliver (or accept delivery of) the cash commodity to estimate their expected price if they place a hedge at today's futures price level. This works because a hedger effectively locks in the futures price when the futures contract is sold, in the case of a short hedger, or when the futures contract is purchased, in the case of a long hedger. Effectively, this means that the difference between a hedger's actual price, at the conclusion of the hedge, and the expected price, at the outset of a hedge, will be attributable to the difference between the actual and expected basis.

Suppose, for example it is April and you will have slaughter cattle ready for market in September. Assume the October Live Cattle contract is currently trading at $78 per hundred weight (cwt.). What does that mean to you when feeding and selling finished steers in Hereford, Texas? To more accurately estimate your expected sale price (net of any gain or loss in the futures market) if you decide to sell October live cattle futures at $78, you need a basis estimate for fed steers at Hereford, Texas during September. Suppose, historically, the September fed steer basis at Hereford averaged negative $2.00 cwt. Given a $78 October futures price, your *Expected Sale Price* would be $76 cwt. [Futures Price ($78) plus Basis (negative $2) equals *Expected Sale Price* ($76)]. This *Expected Sale Price* is what you can expect to receive for the cattle if you sell October Live Cattle futures at $78 and the actual basis when you sell the cattle in September matches your basis forecast of negative $2/cwt.

If the actual basis does not match the basis forecast, the *Actual Sale Price* will not equal the *Expected Sale Price*. For example, if the actual basis in September turns out to be more positive than your forecast, the *Actual Sale Price* will exceed your *Expected Sale Price*. Conversely, if the actual basis in September is more negative than your forecast, your *Actual Sale Price* will be lower than your *Expected Sale Price*.

Knowledge of historical basis levels also can be useful when judging the acceptability of a local cash market price. As equation (2) indicates, a commodity's cash price can be decomposed into its futures price and basis components. The basis component can be compared with historical basis levels for that particular time of year and a judgement made regarding the acceptability of the cash price. If the basis differs substantially from historical levels, some additional research would be warranted to determine why the difference exists and whether it is likely to persist.

Finally, you can generate a forecast of the cash price by replacing basis with *expected* basis. In this case the formula becomes

Expected Cash Price = *Expected* Basis + Futures Price. (3)

This means you can use a basis forecast, in conjunction with the futures price, as a cash price forecasting tool (Kastens, Jones and Schroeder). The technique is straightforward. Simply add today's futures price (choosing the futures contract that will be the nearby contract during the forecast period) and a forecast of the basis during the forecast period to obtain a cash price forecast. To clarify, assume that you need a western Kansas fed steer cash price forecast for mid-November. Take today's December live cattle futures price and add a forecast of the mid-November western Kansas slaughter steer basis to the futures price. The result will be an expected mid-November cash price, based upon today's futures market price and your basis forecast. This futures based price forecast can then be compared to a producer's breakeven price or to forecasts from alternative sources such as university extension economists, the U.S. Department of Agriculture, and market advisory firms.

Constructing Historical Basis Tables

Basis tends to follow the same pattern year after year (i.e., basis is seasonal). As a result, historical basis data can be used to forecast basis. The first step when forecasting basis is to generate a historical basis table to compare basis across years. Setting up weekly basis tables is the preferred approach since it provides enough detail to be useful for forecasting without requiring that you spend an inordinate amount of time collecting prices.

Feeder cattle basis can be computed one day per week for most markets since most feeder cattle auction markets trade just one day per week. When calculating feeder cattle basis, it is important to use futures and cash prices from the same date.

When recording slaughter cattle basis, you have to choose between recording daily or weekly average basis data. However, many cash slaughter cattle markets, such as in western Kansas, the Texas Panhandle, or western Nebraska, do not have an active cash trade everyday. As a result, picking a single day per week (i.e., every Wednesday, which works well when recording grain basis data) to compute basis will yield a surprisingly large number of weeks with no basis to report, simply because the cash trade occurred on days other than the one chosen. To avoid this problem, you can either track daily basis data, taking care to record the cash and futures price from the same date, or average both cash and nearby futures prices for the week and use them to calculate weekly average basis. Whether you choose the weekly average or daily techniques, it's a good idea to use the same approach from week-to-week and year-to-year to ensure consistency.

Calculating basis for slaughter and feeder cattle requires that a rule be established regarding when to change the futures contract used to compute basis. One rule that works well is to continue using the futures contract closest to expiration, as long as it continues to trade the entire week. If the nearby contract expires during the middle of the week, switch all of your calculations for that week to the next closest to expiration contract. To clarify, examine how this rule would have been employed with the February 2001 and April 2001 live cattle futures contracts. February 2001 live cattle futures expired on Wednesday, February 28. Consequently, the last week to compute live cattle basis using the February contract was the week ending Friday, February 23. Basis for the week ending March 2 was computed using the April live cattle futures contract since, by the end of that week, it was the new nearby futures contract.

Remember, anything that affects local cash prices will have an impact on basis. For example, since feeder steer and heifer basis is computed using the same futures contract, feeder steers and heifers will generally have a much different basis because heifer prices typically trade at a substantial discount to steer prices. Similarly, different feeder cattle weight classes will also have substantially different basis levels and patterns because light weight cattle prices generally trade at a premium to heavy weight cattle prices and follow a different seasonal pattern. As a result, it's important to have data available for the appropriate sex and weight cattle.

Other factors that influence cash prices can also have a big impact on basis. Prices for Choice and Select slaughter cattle vary and, as a result, basis for these two quality grades differs. Similarly, there are a wide variety of physical characteristics that influence cash sale prices for feeder cattle, all of which will impact the basis for a particular pen of steers or heifers.

Forecasting Basis

Since basis is seasonal, historical basis data can be used to help forecast future basis levels. The basis tables described previously can be a great help when

forecasting feeder or slaughter cattle basis. The simplest technique, and one of the most reliable, is to use the historical average basis level for the week of interest as a forecast. Recent research indicates that, generally, three year averages are preferred when forecasting feeder cattle or slaughter cattle basis (Dhuyvetter and Parcell).

Forecasting Example

Table 1 provides historical weekly feeder steer basis data for steers weighing 700-800 pounds which were sold at the Winter Livestock Auction in Dodge City, KS. If you are interested in forecasting basis for 700-800 pound steers which will be marketed in southwest Kansas the week of October 17, 2001, it's reasonable to expect basis to be near the three-year average of negative $1.77 per cwt. However, you should also recognize that the actual basis could be above or below that level.

Updated Basis Information Available on the World Wide Web (WWW)

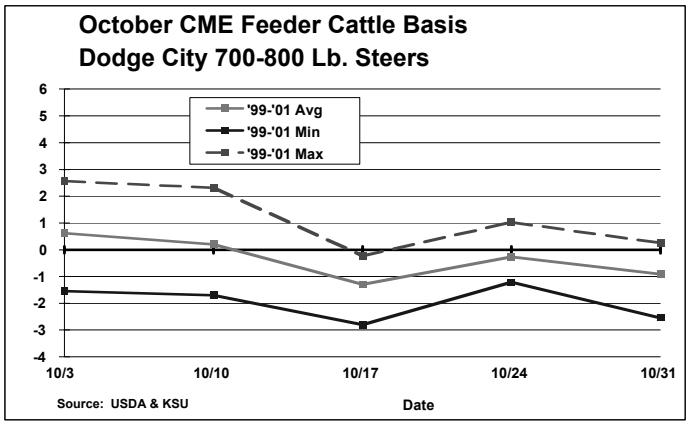
Although it's best to maintain your own historical basis data for markets that you customarily use, current livestock basis data for several major markets is available from Kansas State University on the World Wide Web. Point your web browser to the following address:

http://www.agecon.ksu.edu/livestock

to obtain historical basis information for feeder cattle (Dodge City, KS), and slaughter cattle (Kansas slaughter steers and heifers). Weekly historical basis charts are available for each futures contract and the nearby basis chart is updated each week. In addition, many other state university Extension programs have historical cattle basis available for local markets.

Table 1. Dodge City, KS 700-800 Lb. Feeder Steer Basis Chicago Mercantile Exchange October Feeder Cattle Futures

Sale Dates (2001)	1999	2000	2001	3 Year Average
		$/cwt.		
10/3	0.83	-1.55	2.57	0.62
10/10	-1.70	-0.01	2.31	0.20
10/17	-0.83	-2.80	-0.23	-1.29
10/24	-1.22	-0.62	1.03	-0.27
10/31	-0.43	-2.55	0.25	-0.91



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Managing for Today's Cattle Market and Beyond

March 2002

Factors Affecting the Basis for Feeder Cattle

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Introduction

Basis is one of the most useful concepts in developing marketing strategies for agricultural commodity markets. Basis information is a critical part of forward pricing and spot market decisions and forecasting basis is an essential element when one is making these types of decisions. For example, the relative success of parties involved in contracts depends, in large part, on the ability to accurately predict the basis.

Basis has a geographical aspect because it is usually defined as local cash price minus the futures contract price. Basis indicates the relative strength or weakness of prices in one geographic location relative to a broad, general market like the futures market. The basis is different in different locations because local prices are not the same for a number of reasons including differences in transportation costs to principal feeding and processing locations and differences in local supply and demand conditions.

The relative variability of basis in different locations can also vary and may affect the ability of producers at any particular geographic location to effectively contract using basis information. For example, hedgers typically view hedging as a risk management method since they want to reduce the variability of the prices they receive.

The expected forward price of a hedge is the following equation:

(1) $FP_{t+n} = F_t + BASIS_{t+n}$,

where FP_{t+n} is the expected forward price to be received n days after a hedge is placed (say the day cattle are to be sold), F_t is the futures price the day the hedge is placed and $BASIS_{t+n}$ is the local basis the day the hedged cattle are sold and the futures position is closed. As implied in equation (1), hedgers are trading cash market risk for basis risk. Hedgers will only reduce price variability if basis variability is less than cash price variability.

This article examines the level of basis and the influence of different market conditions on the level of basis. The relative variability of cash prices and basis in four feeder cattle markets for two different weights of feeder steers is also examined to determine if hedging at these locations can routinely reduce the variability of prices received by hedgers.

Data for this analysis were provided by the Livestock Marketing Information Center in Denver, Colorado. The data covered the period from January 1, 1990 to October 7, 2000, were measured weekly at each location, and included local cash prices, futures prices, and basis information. The markets included in the analysis are Oklahoma City, OK (OK City); Billings, MT; a composite price for Washington, Oregon, and Idaho (WA); and Alabama (AL). The markets were selected to represent

different parts of the United States as well as markets with different types of cattle, different types of feeding opportunities (winter grazing vs. feeding hay), and different levels of market activity. For example, Oklahoma City is one of the most active feeder cattle markets in the country in terms of volume across the year while volume in the other markets tends to be more seasonal. The steer weights selected were 500-600 lbs. and 700-800 lbs. and represent basically calves and yearlings.

Level of Basis

Average basis for 500-600 lb. and 700-800 lb. steers in the four markets is presented in Figures 1 and 2, respectively. Seasonality plays a big role in 500-600 lb. steer basis levels since the basis tended to be much stronger during the spring months and weaker in the fall months coinciding with the availability of pasture grazing and the fall calf run, respectively (Figure 1). Seasonality in the basis existed but was less pronounced for 700-800 lb. steers than for 500-600 lb. steers (Figure 1 compared to Figure 2).

The OK City basis was the strongest of the four markets throughout the year for both 500-600 lb. and 700-800 lb. steers (Figures 1 and 2). The Billings basis for 500-600 lb. steers was almost as strong as the OK City basis except during the summer months. This may be because few calves are sold in Billings during the summer or that the calves being sold in Billings during the summer months are lower than average quality. The AL basis was consistently the weakest for both 500-600 lb. and 700-800 lb. steers except in the late winter and early spring when it about equals the WA basis. Pasture grazing is more available in AL during these months than in the other locations and may account for why AL was relatively strong during that part of the year.

Basis Variability

How strong or week a local basis is at any given location depends on local supply and demand conditions. However, the same set of factors may affect local supply and demand differently across the country. The factors assumed in this article to affect local basis are defined as the following:

(2) $BASIS_i = f(HISTORY, PROFIT, TREND, CYCLE, SEASON, SPECS, BASIS_{t-1})$.

Equation (2) states that the basis at location *i* (where *i* = OK City, Billings, WA, and AL) is a function of the past history of the basis in that location (*HISTORY*), the expected profitability of cattle feeding (*PROFIT*), trends in the basis (*TREND*), the location of the cattle cycle (*CYCLE*), seasonality *(SEASON*) and changes in the weight specifications for the Chicago Mercantile Exchange feeder cattle futures contract (*SPECS*) (Parcell, Schroeder, and Dhuyvetter).

Regression analysis can be used to identify factors that cause the basis to vary. Equation (2) provided the foundation for this part of the analysis and the regression results for the four markets and two steer weights are reported in Table 1.

Hedgers are sometimes encouraged to use historical basis information when making hedging decisions (e.g. Purcell and Koontz). In this article the history of the basis (*HISTORY*) was measured as the average basis for the preceding three years for a particular week. The effect expected cattle feeding profitability (PROFIT) had on the current basis was measured by the current corn price in Omaha and by current or expected slaughter cattle prices. In the case of 500-600 lb. steers, the current live cattle futures price for the live cattle futures contract closest to, but not preceding, the time the steers would be expected to be ready for slaughter[1] was used for slaughter cattle prices. For 700-800 lb. steers the current fed cattle price was used. Trends in the local basis (*TREND*) were measured as a simple linear trend and were meant to capture the affect of changes in transportation costs, increases in cattle production efficiency, etc. Cattle cycles are expected to influence local basis since buyers extend their procurement areas during times of tight feeder cattle supplies. The effect of the cycle on local basis (CYCLE) was measured by de-trended beef cow inventories in the United States.[2] Seasonality (SEASON) was measured using monthly variables (technically dummy variables) in the regression equation with December as the base month. The effect that changes in the weight specifications for the feeder cattle futures contract have had on local basis is measured in the regression equations by dummy variables.[3] Current conditions probably reflect conditions that also existed in the recent past. In other words, if basis levels have been strong

(weak) in the recent past (one week ago) they may also be strong (weak) during the current week. To measure this, the basis from the previous week ($BASIS_{t-1}$) was included in the regression equations.[4]

As expected, seasonal variations in basis explain a large part of it variation as evidenced by the many monthly dummy variables in all eight models that have coefficients significantly different than zero (Table 1). Current cattle feeding profitability seemed to have a more consistent effect on the basis for 500-600 lb steers than it did for 700-800 lb. steers. However, current fed cattle prices did have a significant impact on the current basis for 700-800 lb. steers in the OK City and AL markets. Widening the range for the feeder cattle price index used to cash settle the feeder cattle futures contract appears to have improved the basis for 700-800 lb. steers in all four markets.[5]

Surprisingly, the only market where the average basis for the previous three years was a significant determinant of the current basis was in the OK City market for 700-800 lb. steers (*HISTORY* in Table 1). This does not suggest that historical basis information is not valuable, but indicates that the center of the distribution for historical basis in these markets (the average historical basis) may be an inadequate forecast of the current basis. Forecasts of basis need to account for the location within the historical basis distribution rather than using just the average or the center of the distribution.

Lagged basis (*BASISt*-1) was a significant determinant of the current basis level since its parameter estimate was positive and significantly different than zero (Table 1). This suggests that when basis is strong (weak) it will tend to remain strong (weak). Consequently, when current basis is in the upper (lower) part of the historical distribution it will tend to remain strong (weak).

Over time (*TREND* in Table 1), there has been a slight improvement in the basis for 500-600 lb. steers in Billings and WA and for 700-800 lb. steers in Ok City and AL. Possible reasons for this could include relatively low energy cost that existed during most of the 1990s or increases in feeding efficiency.

Cattle cycles tend to improve the basis for the more remote markets when beef cow numbers are low, especially for calves (see *CYCLE* for Billings and WA in Table 1). This is probably because feeder cattle buyers tend to extend their procurement areas when feeder cattle supplies are tight. As a result, buyers not usually in the Billings or WA market may enter those markets when cattle inventories are low and increase the level of competition for cattle there.

Since the 700-800 lb. steer models have only a few parameters that are significantly different than zero, and also have lower adjusted R^2s than the 500-600 lb. steer models, one can conclude that variability in the heavier steer basis is more random than the lighter steer basis. Or at least, that the basis for 700-800 lb. steers are not as strongly affected by the variables included in the regression models as the 500-600 lb. steer basis. An out-of sample forecast of the basis in each of the four markets and for both weights was conducted for the first 41 weeks of 2000. The root mean squared prediction error shows that the forecasts generated for the 500-600 lb. steers were more accurate on a percentage basis than for the 700-800 lb. steers.

Figures 3 and 4 report the relative variability of the local basis compared to variability for local cash prices for 500-600 lb. and 700-800 lb. steers, respectively. The percentages reported in Figures 3 and 4 were obtained by dividing the standard deviation for the local basis for each week of the year by the standard deviation of local cash prices during that same week.[6] The relative variability of the basis is less than the variability of local cash prices for all markets and for both weights (Figures 3 and 4). This indicates that hedgers can reduce their price variability in these four markets. However, relative basis variability is greater for 500-600 lb. steers than for 700-800 lb. steers. OK City had consistently less relative variability in its basis for 700-800 lb. steers than the other three markets and also had one of the lowest relative basis variability levels for 500-600 lb. steers.

Conclusions

These results suggest that contracting to reduce price variability has tended to be more successful for 700-800 lb. steers than for 500-600 lb. steers. Based on the parameter estimates and adjusted R^2 reported in Table 1 and the analysis presented in Figures 3 and 4, the basis for 700-800 lb. steers is more stable than for 500-600 lb. steers, but variability in the basis for the heavier steers is more random than for the lighter steers. The OK City market of 700-800 lb. steers appears to have the most stable basis of all

of the markets analyzed. Variability in the light steer basis is affected by current profitability in cattle feeding, seasonality, and lagged basis. The heavier steer basis seems to be mostly driven by seasonality and changes in the cash settlement price index.

This exercise demonstrates that forecasting basis is not a simple exercise. Using average historical basis as a forecast of the current basis does not appear to be a good predictor except in the case of the OK City market for 700-800 lb. steers. If feeding cattle is profitable during down swings in beef cow numbers, basis will tend to be stronger for 500-600 lb. steers than when beef cattle numbers are relatively large and cattle feeding is not profitable. Since basis is difficult to forecast, producers should exercise caution when forecasting the basis. To forecast basis, it may be more advantageous to consider ranges in the basis, such as a best and a worse case scenario, so that a range of risk is considered rather than relying on a single number.

Table 1. Parameter Estimates for Basis Models for Four Locations 500-600 lb. and 700-800 lb. Steers.

	Market and Steer Weight in Cwts.							
Independent Variable	**OK 5-6**	**Billings 5-6**	**WA 5-6**	**AL 5-6**	**OK 7-8**	**Billings 7-8**	**WA 7-8**	**AL 7-8**
Intercept	-6.260	-4.554	-16.130**	-11.397**	-2.445	3.240	2.560	-12.567**
HISTORY:	-0.050	0.000	0.012	0.076	0.252**	-0.031	0.096	-0.033
PROFIT:								
Corn price	-1.165**	-0.520	-0.658*	-0.783**	0.042	-0.102	0.351	-0.179
Futures price	0.226**	0.125*	0.284**	0.200**				
Fed price					0.066**	-0.044	-0.058	0.121**
TREND:	-0.002	0.004*	0.006**	0.006**	-0.003*	-0.001	-0.003	0.005*
CYCLE:	-0.001	-0.001*	-0.002*	0.000	0.000	0.000	-0.001*	0.000
SEASON:								
January	-0.297	1.492*	1.064	0.022	-0.619	0.049	0.691	0.115
February	2.030**	2.733**	2.369*	0.325	-0.629	0.434	1.398*	0.064
March	3.612**	3.160**	4.242**	0.826	-0.989**	0.506	2.117**	-0.114
April	2.735**	2.308**	4.196**	-0.276	-0.865*	0.703	2.191**	-1.085
May	1.986*	1.971**	2.900*	-1.308*	-0.683	0.901	2.041**	-0.742
June	0.048	0.635	1.739	-1.206*	-0.791*	0.232	1.006	-0.104
July	-3.675**	-5.206**	-4.994**	-2.253**	0.461	-0.611	-1.130*	-0.732
August	-0.910	-1.455	-1.547	-2.573**	-0.538	-0.278	0.278	-0.054
September	-2.365**	-2.333**	-2.697**	-2.598**	-0.374	0.390	-0.890	-0.414
October	-2.209**	-0.830	-1.370	-2.332**	-0.617	0.504	0.249	-1.259*
November	-4.841**	-4.738**	-6.252**	-2.625**	0.036	-1.222*	-2.834**	-0.447
SPECS:	0.336	0.132	0.014	-0.890	1.189**	1.096**	1.514**	-1.178*
$BASIS_{t-1}$:	0.564**	0.641**	0.482**	0.684**	0.303**	0.341**	0.284**	0.234**
Adjusted R^2	0.873	0.878	0.843	0.928	0.359	0.208	0.474	0.133
Observations	319	319	319	319	319	319	319	319
Durbin-Watson	2.190	2.292	2.140	1.994	1.931	2.066	2.053	2.054
Out-of Sample RMSPE	1.189	1.268	1.459	1.905	26.746	57.155	20.561	12.070

* indicates statistically different than zero at the 10% level of confidence.
** indicates statistically different than zero at the 5% level of confidence.

Figure 1. Average Weekly Basis for 500-600 lb. Steers, 1990-2000.

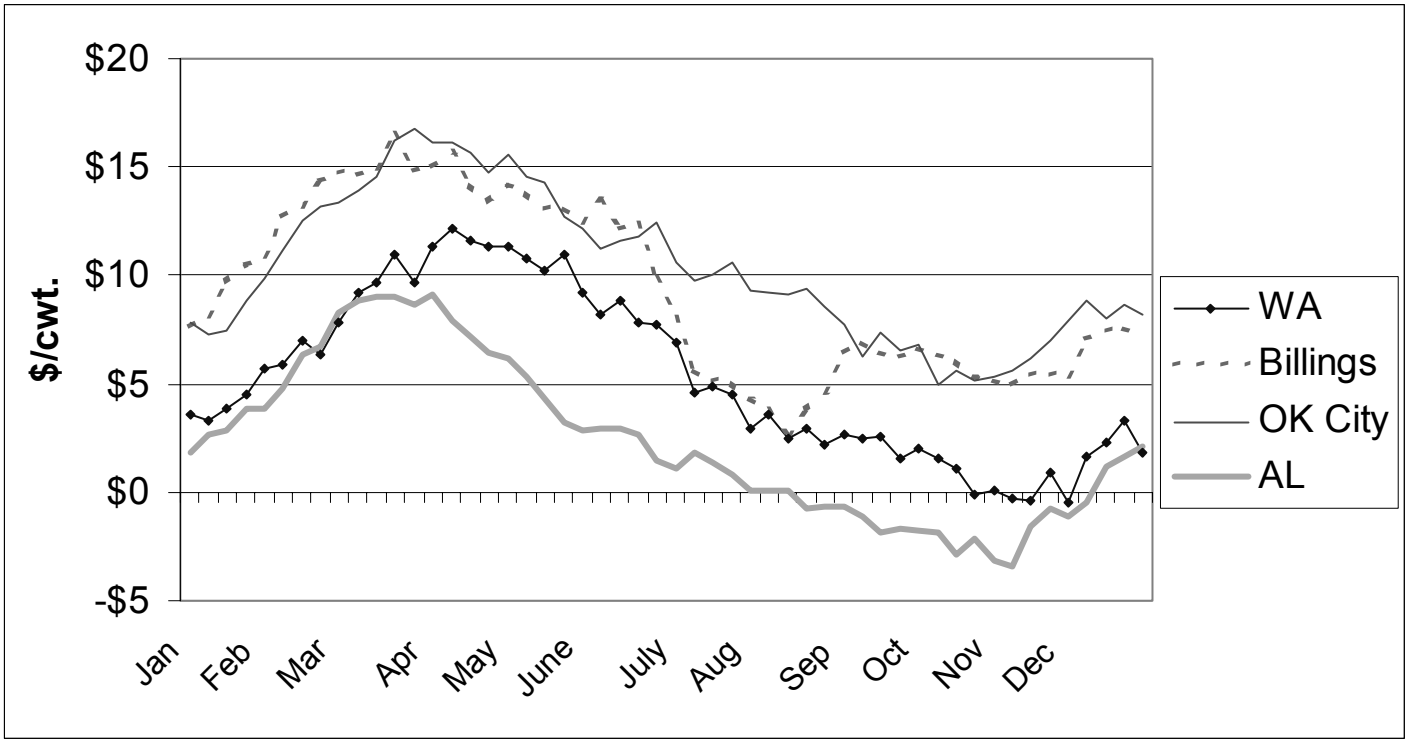


Figure 2. Average Weekly Basis for 700-800 lb. Steers, 1990-2000.

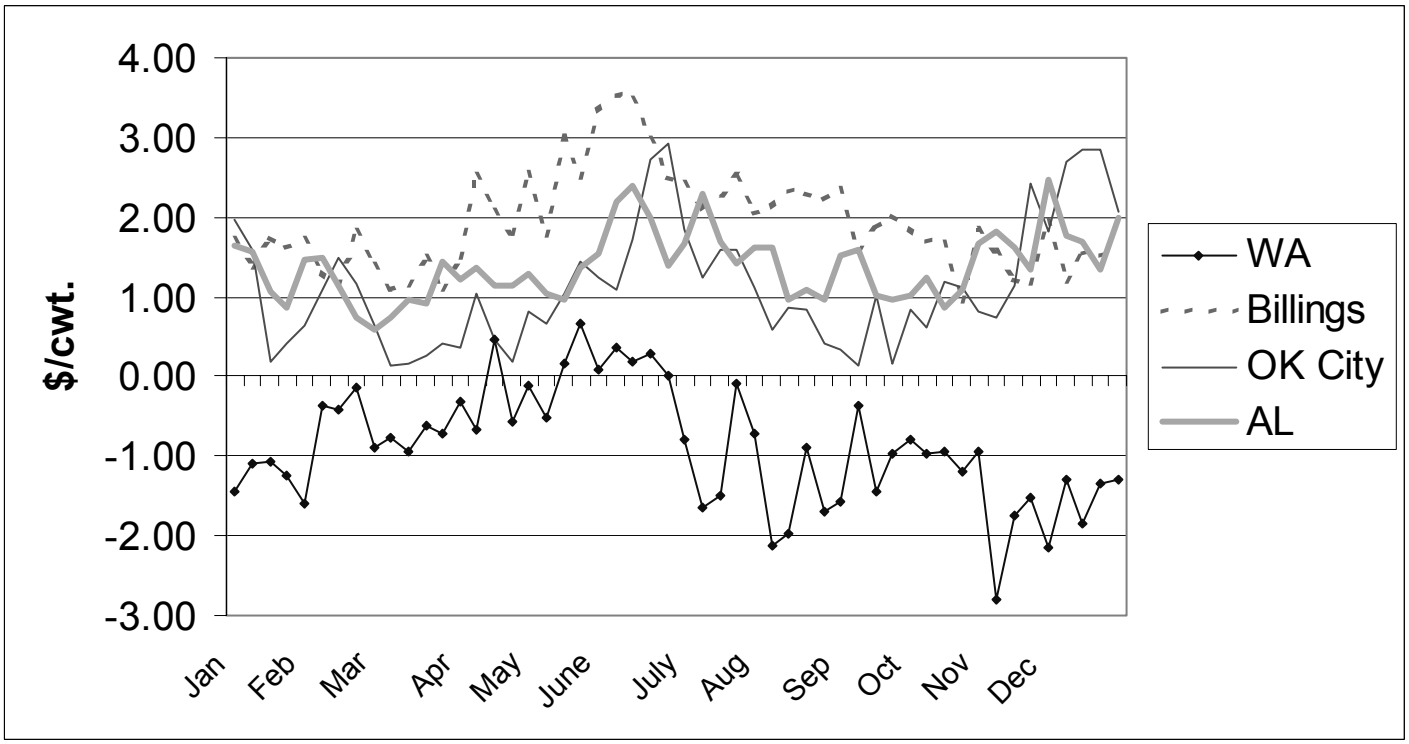


Figure 3. Relative Variability in Local Basis and Cash Prices for 500-600 lb. Steers, 1990-2000.

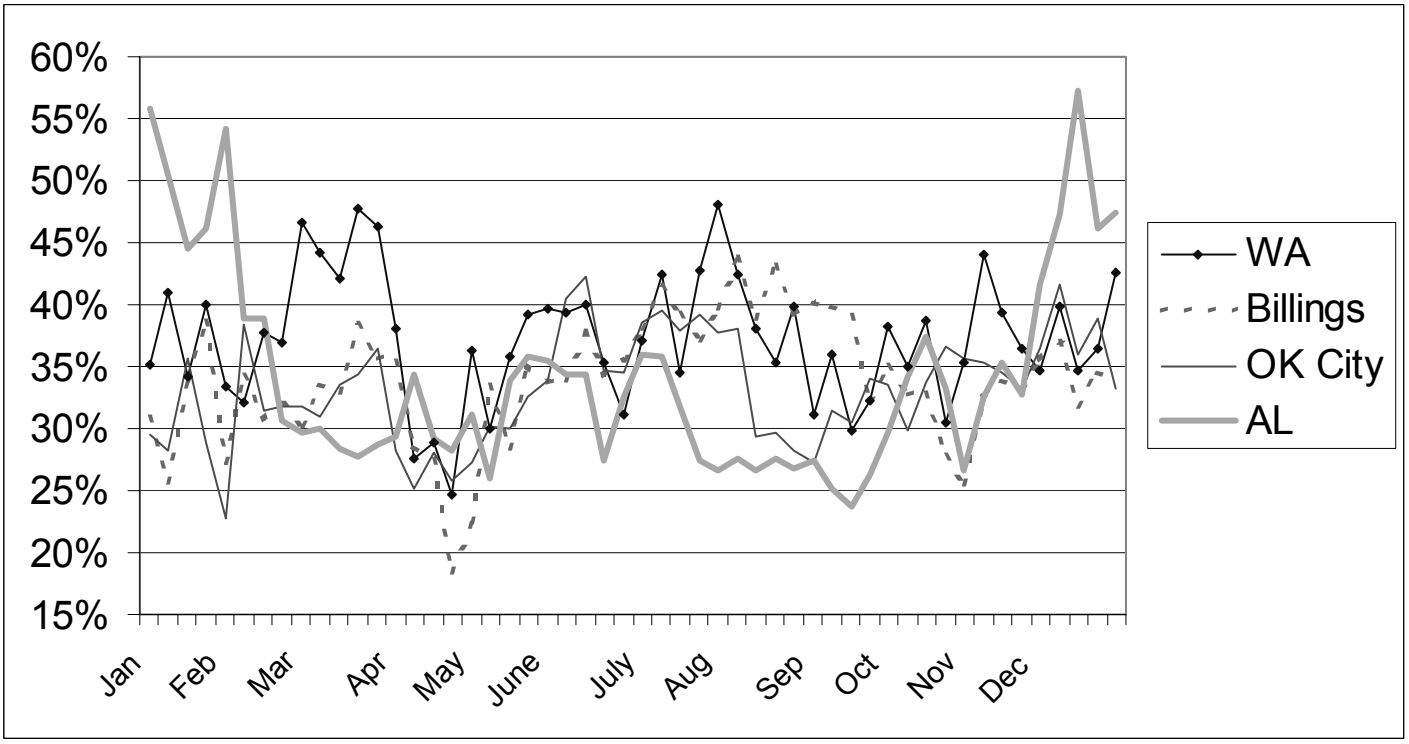
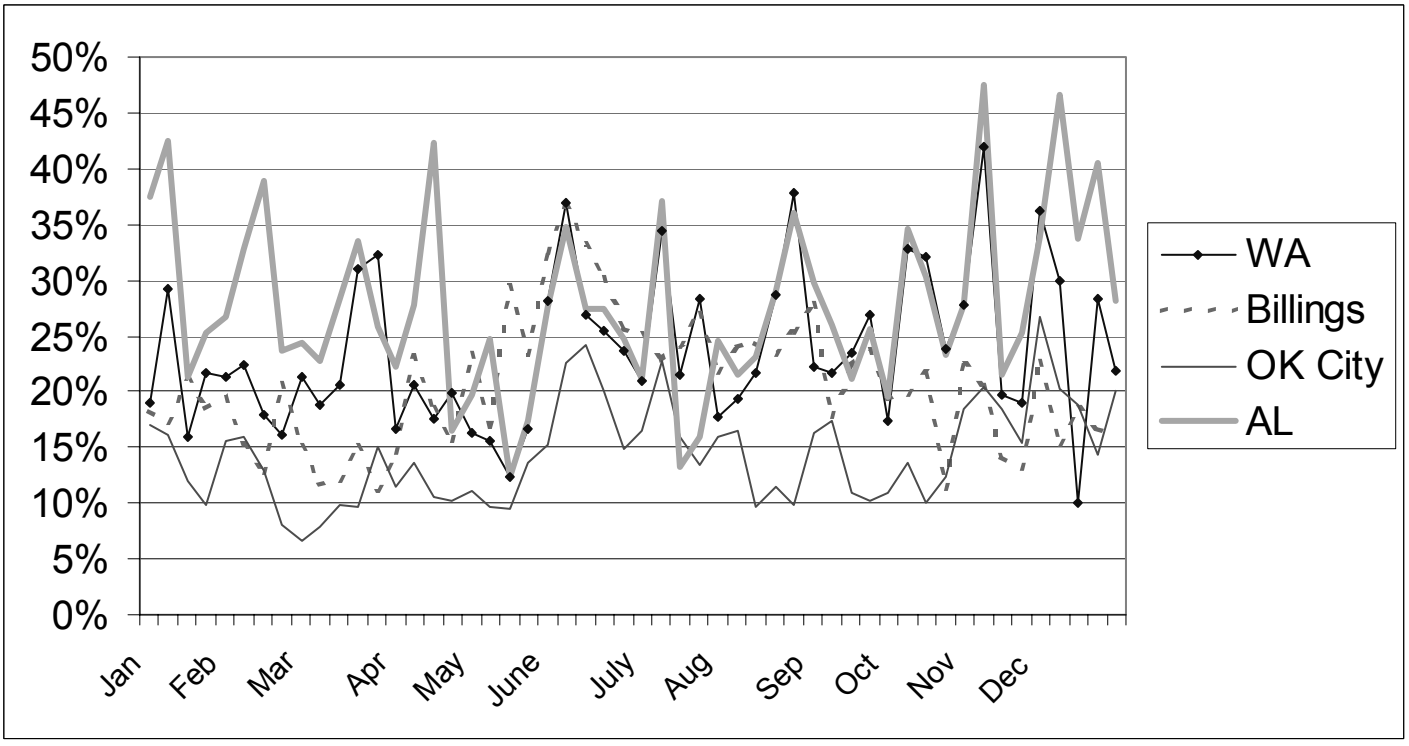


Figure 4. Relative Variability in Local Basis and Cash Prices for 700-800 lb. Steers, 1990-2000.



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[1] We estimated that 500-600 lb. steers would be ready for slaughter in seven months if placed directly in a feedlot. Pre-testing showed that current fed cattle prices had a stronger relationship with current basis than current live cattle futures prices for the month when the cattle were expected to be ready for slaughter (about 5 months hence).

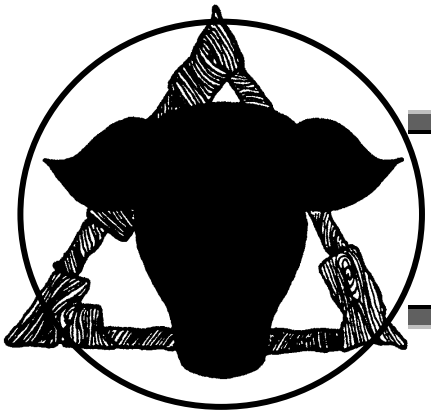
[2] De-trended beef cow numbers were the residuals for the years 1990-2000 obtained from regressing annual US beef cow inventories on a linear trend between 1940-2000. A quadratic trend coupled with the linear trend was also analyzed but found to have a coefficient not significantly different than zero, so the linear trend model was used.

[3] Prior to January 1993, the CME feeder cattle contract was cash settled using a price index for 600-799 lb. steers. Between January 1993 and November 1999, feeder cattle contracts were cash settled using a price index for 700-799 lb. steers, and since November 1999 the contracts have been cash settled using a weight range of 700-849 lbs.

[4] Including a lagged basis also eliminated autocorrelation in the regression equations since the basis appears to follow an AR(1) process

[5] This is not surprising since expanding the weight range for the cash settlement index from 700-799 lbs. to 700-849 lbs. should tend to decrease futures contract prices and hence improve basis.

[6] Standard deviations were calculated for each week of the year based on data over the 11-year period (1990-2000).



Managing for Today's Cattle Market and Beyond

March 2002

Basis Forward 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 vary also, 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 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. (see other fact sheets in this series on 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 (as discussed in other fact sheets in this series, *Live and Dressed Weight Pricing* and *Grid Pricing*). 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). Assume the historical average basis for August in the Texas Panhandle is -$1.47/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/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 yearlong period has shown this risk transfer premium to be substantial, perhaps $1.50-$2.00/live cwt. (Ward, Koontz, and Schroeder 1996). However, more research is needed to understand the details of this difference for specific locations and other time periods. In the Table 3 example, a $0.50/cwt. risk premium is assumed.

Table 1. Basis Forward Contract Bid Example

STEP 1: Begin with an Average August Basis		
Historical August Basis (Fed steers, Amarillo)		-$1.47/cwt.
STEP 2: Adjust the Historical Basis		
Add a market adjustment factor	+0.25	
Subtract a risk transfer premium	-0.50	
Adjusted Historical Basis	-1.72	
Basis Bid (rounded to the nearest five cents)		-$1.75/cwt.
STEP 3: Feeder Picks the Live Cattle Futures Price		
"Estimated" Highest August Live Cattle Futures		$72.00
Sale Price ($72.00 - $1.75)		$70.25/cwt.

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 -$1.75/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 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 $72.00/cwt. Then, the selling price is automatically discovered at the futures market price minus the contract basis (-$1.75/cwt.), or $70.25/cwt. Regardless, what happens to cash market or futures market prices between that time and delivery of the cattle, the sale price remains at $70.25/cwt.

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 $72.00/cwt. so then the transaction price was $70.25/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. And since the hedger assumes basis risk, we see the main reason for the 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 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 thereby 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. 1991).

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 be used to 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 formula or grid prices (see another fact sheet in this series, *Base Prices and Premiums-Discounts 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.

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 another fact sheet in this series, *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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