Hedging Livestock Price Risk with Options on Futures Contracts

Brian Coffey
Department of Agricultural Economics
Kansas State University
bcoffey@ksu.edu

Introduction

Hedging with options on futures contracts is a price risk management tool available to producers or businesses who buy or sell livestock. This article will explain the basics of this price risk management strategy. A firm understanding of futures contracts and hedging with futures is helpful to understanding hedging with options. If you are not familiar with those concepts, it would be worthwhile to spend some time reviewing them before reading this paper. There are many quality resources available online. Two that are helpful to begin with are the CME Group self-study guide (here) and a PowerPoint presentation available on AgManager.info (here).

The following sections define options on futures and related details. Those somewhat familiar with options might prefer to skip directly to the hedging examples.

Definition and Basics of Options on Futures

Futures contracts are legally binding agreements to provide (i.e., take a short position or sell) or accept (i.e., take a long position or buy) a specifically defined quality and quantity of an underlying commodity at a certain time in the future. The point of emphasis is that **a futures contract is a legally binding obligation**. Once entered into, the position holder must either hold the contract to expiration liquidate it by settlement or liquidate the existing positing by taking an equal and offsetting futures position before expiration.[1] There are also options on futures contracts. **An option is a derivative linked to a specific futures contract that gives the holder the right, but not the obligation, to take a futures position**. Options are more flexible than outright futures positions but that flexibility comes at a price.

An option on futures is described by three points:

1. The underlying futures commodity and contract month
2. Whether the option is a Put or Call
3. Strike price
4. Premium

The first point is straightforward but bears emphasizing. An option is always linked to **a specific futures contract**. For example, options are available on the November 2021 CME Feeder Cattle Contract. The second point indicates what right the option holder has. A **put** option gives the holder the right to establish a short position (i.e., sell) in the underlying futures contract. A **call**, on the other hand, gives the holder the right to establish long position (i.e., buy) in that same contract. Continuing with the previous example, a November 2021 Feeder Cattle Call option gives the holder the right to establish a long position in November 2021 Feeder Cattle at any point during the life of the option. The **strike price** is the price at which the long or short position can be

[1] Live Cattle futures are deliverable. During expiration month the holder of a short position may issue delivery and satisfy the contract by providing physical cattle that meet contract specifications. The holder of a long position in expiration month may be assigned a delivery issued by the short position holder. CME Group has detailed rules and regulations governing delivery.

taken. If we use a strike price of $145/cwt then we have the first three points in the definition—A $145 Call option on November 2021 Feeder Cattle gives the holder the right to establish a long position in November 2021 Feeder Cattle at $145 at any point during the life of the option.

The **premium** is the amount one must pay for the right that was just explained. An option premium is a one-time payment (plus associated commission fees) that is best thought of as being gone forever. Unlike an outright futures position, the purchaser of an option has no ongoing margin requirements while holding the option.

Once a person has purchased an option, there are a few possible outcomes.

1. The option can expire worthless
2. The holder can choose to exercise the option or the option may be automatically exercised at expiration
3. The holder can sell the option

The first outcome of expiring worthless is the most common fate of options on futures. This happens if, when the option reaches the end of its life, there is no value to the holder of taking the futures position available to them. For example, consider a $145 Call option on November 2021 Feeder Cattle. On the last trading day of November, the option (and underlying contract) will expire. If the November 2021 Feeder Contract is trading at $140, what are the option holder's alternatives? Exercising the option will give the holder a long **futures** position at $145, which will have to offset by taking a short position (selling) in the same contract at the market price of $140. Buying at $145/cwt and selling at $140/cwt would result in a $5/cwt loss. Since the Feeder Contract is for 50,000 pounds, that translates into a loss of $2,500. A rational option holder would not do this and, since the option is a right and not an obligation, does not have to. The holder can simply do nothing and let the option expire.

Alternatively, the holder may exercise the option if doing so would be profitable. In the above example, if November 2021 Feeder Futures were trading at $150/cwt, taking a long position at $145/cwt would give the holder an opportunity to offset that by selling higher, at $150/cwt, and gaining $5/cwt or a total of $2,500. This is the flexibility the option offers. If it is profitable to exercise an option, it will automatically be exercised upon expiration, unless the holder specifically instructs their broker that it not be.

The final outcome available to the option holder is sell the option before it expires. Options are like futures contracts, in that one can offset buying an option by selling it, thus liquidating the position. In this case the option premium is the important price. The holder will sell the option back at the prevailing market premium for that specific option.

Option Premiums

As explained, options on futures are linked to futures contracts. However, the options markets function like any other with interested parties making bids and offers. These

bids and offers for options are in terms of the option premium. Since an option is linked to a futures contract, these option premiums offer quite a lot of market information. As this article is focused on how to hedge with options, we will not spend a lot of time on premiums but some knowledge about them is helpful.

Option premiums are determined by how volatile traders perceive the underlying futures contract price to be. All else equal, it is harder to predict the future price of a highly volatile contract and the premium for an option on that contract will be higher. In times when traders perceive lower future volatility, premiums decrease. Option premiums, which reflect volatility of the underlying futures prices, have two major components:

1. Intrinsic Value
2. Time Value

Intrinsic value is the return one could receive by buying and immediately exercising the option. We never think of intrinsic value as being negative since an option does not have to be exercised. Intrinsic value is either zero or positive. Remember our previous call option example. A $145/cwt call has an intrinsic value of $5/cwt if underlying futures are trading at $150. On the other hand, the same option has an intrinsic value of $0/cwt if the futures price is $140/cwt.

Intrinsic value is also used to divide options into three categories. This terminology is widely used and should be understood.

Designation of Options	Definition
In the Money	An option with a positive intrinsic value For Puts this means Strike Price > Futures Price For Calls this means Strike Price < Futures Price
At the Money	An option where Strike Price = Futures Price Note that precisely At the Money options seldom exist, as strike intervals are limited (Table 1). At the Money is used to mean Strike Price is very close to Futures Price
Out of the Money	An option that has **no** intrinsic value For Puts this means Strike Price < Futures Price For Calls this means Strike Price > Futures Price

Time value is the other component that determines premium and is directly related to predicted volatility. Put in the simplest terms, the longer an option can be held the higher the likelihood that exercising it will be profitable at some point. The farther out in the future the option expiration, the greater the time value. As an option approaches expiration, the time value erodes and the premium converges no intrinsic value.

Selling Options

The discussion of option premiums and time value is a suitable place to point out that, like futures, options are a zero sum game. Whenever a person buys an option at a given

premium another person sells[2] a matching option at the same premium. In this transaction, risk is being transferred. For example, a person who buys a call option either hedging against rising cash/futures prices or speculating that futures price will rise. In either case, the option gains value as the underlying futures price increases. The person who sells a call is taking the opposite position. This person is getting paid to be liable for rising futures prices. Take our $145 call example. The person who sells a $145 call risks taking a **short** position at $145 if the holder of the option chooses to exercise. The option seller must take the opposite futures position to maintain equal long and short positions. That means if futures price is above $145 and the option holder elects to exercise, the option seller is forced to take a futures position that will result in a loss equal to the option holder's gain. The greater risk the of this occurring the greater the premium required to give option sellers incentive to sell options. If volatility is higher or there is a longer time left until expiration sellers will have to be compensated for the increased risk.

Hedging Livestock with Options

With that brief background in the concept of options, we will go through the specifics of how purchasing an option can be a viable strategy to manage livestock price risk. Table 1 lists the livestock products available through CME Group. Contract trading units are included only as a reminder to readers of the specifications of each contract. Contract specifications are lengthy and detailed. Please visit the CME Group website (linked below Table 1) to research and understand details of each contract. Beef cattle have two contracts: Feeder Cattle and Live Cattle. For several years, hogs/pork had only the Lean Hog contract. In 2020, the Pork Cutout Contract was introduced as a price discovery and risk management derivative that was farther downstream (i.e., closer to the products bought by end consumers) than the Lean Hog Contract. The contract is quite new but has several months available and options are being traded on each contract.

Notice some of the differences between commodities. Live Cattle is the only underlying contract that is deliverable. As a result, **options on Live Cattle expire before futures contract expiration month**. This is due to the fact that delivery can basically turn the right of the option into an obligation. All other livestock contracts are financially settled and their options expire at the same time as the contracts. Each commodity also has contracts available in specific months and options correspond to those monthly contracts. For example, it is impossible to buy an option on the Lean Hogs contract that expires in March. Again, options on the Live Cattle Contract differ slightly. CME offers one option on Live Cattle in a serial month. That is, a non-contract month. This is always the nearest non-contract month and is tied to the next future contract. For example, in March, May options will be offered that are connected to the June contract. These will expire on the first Friday of May (adjusted for holidays).

Just as in hedging with futures, the hedger should determine the correct commodity, calendar month, and quantity of commodity to be hedged. Each option corresponds to the quantity of one futures contract. If a hog feeder wished to fully hedge the sale of the

[2] In industry terms "writing" options is a synonym for selling options.

equivalent of 80,000 carcass pounds of lean hogs in July, she needs two options on the July Lean Hog Contract.

Once the appropriate commodity and quantity have been chosen, the mechanics of hedging are the same across commodities. We will go through two hedging examples to illustrate those mechanics. There are certainly intricacies of each commodity that make executing a hedge different for each one. It is beyond the scope of this paper to address all of those. Readers are encouraged to build on the basic knowledge of this article and spend time learning more details specific to their individual situations.

Table 1. Summary of CME Group Options on Livestock Futures Contracts

	Underlying Contract			
	Live Cattle	**Feeder Cattle**	**Lean Hogs**	**Pork Cutout**
Contract Trading Unit	40,000 lbs live weight of beef steers or heifers (70% Choice and 30% Select)	50,000 lbs live weight of feeder steers (700 to 899 lbs)	40,000 lbs of lean value hog carcasses	40,000 lbs of 215-lb, 55-56% lean pork carcasses (0.55-0.70 in. of back fat at the last rib or equiv.)
Contract Months	Feb, Apr, Jun, Aug, Oct, Dec, Plus one serial	Jan, Mar, Apr, May, Aug, Sep, Oct, Nov	Feb, Apr, May, Jun, Jul, Aug, Oct, Dec	Feb, Apr, May, Jun, Jul, Aug, Oct, Dec
Strike Intervals:				
All Months	$2.00/cwt	$2.00/cwt	$2.00/cwt	$2.00/cwt
3 Front Months	$1.00/cwt	$1.00/cwt	$1.00/cwt	$1.00/cwt
Spot Month		$0.50/cwt		
Futures Settlement	Deliverable	Financial	Financial	Financial
Expiration	First Friday of Contract Month	Expires with underlying contract	Expires with underlying contract	Expires with underlying contract

Note: This basic summary is the author's synthesis of CME Group material. To learn more about the details and contract specifications of livestock futures and options visit https://www.cmegroup.com/trading/agricultural/livestock.html

Example 1: Hedging the Sale of Live Cattle with a Put Option

For this example, it is late December and a cattle feeder is going to buy feeder cattle and put them on feed for about five to six months and then sell them as live cattle. The

feeder wants to manage the risk around the sale price of live cattle. That means the feeder should buy a put option on the Live Cattle Contract. The feeder plans to have 40,000 pounds of live cattle to sell, so an option on one contract is needed. The cattle will finish near June, so an option on the June contract is appropriate. The feeder would then need to look at available strike price and premium combinations to choose a strike level. In this case, we will use a $110/cwt put with a premium of $4/cwt. Table 2 shows the feeder's situation at placement of the feeder calves.

Table 2. Cattle Feeding Example: Situation at Placement

Feeder Cattle Market Information	
Feeder Cattle Cash Price	$140/cwt
Feeder Average Weight	800 lbs
Head	30
Live Cattle Market Information	
Live Cattle Cash Price	$108/cwt
Live Cattle Futures Price	$113/cwt
Put Option Strike	$110/cwt
Put Option Premium	$4/cwt
Expected Basis at Sale Time	-$3/cwt

Hedging with futures allows a producer to better predict the net price received (or paid) and avoid catastrophic losses from large price moves. Hedging with options also protects against catastrophic losses but allows a seller to establish an **approximate price floor**. In this example the cattle feeder would use the purchase of a put to establish a price floor as follows in Equation 1:

Equation 1. Calculating Approximate Price Floor

Price Floor =
Put Option Strike Price + Expected Basis – Put Option Premium – Broker Fees

Broker fees will vary. Fees will also depend on whether you exercise or sell the option. For the purposes of this example, we will assume the option is exercised at the time of sale and ignore broker fees. In practice, a hedger might determine the fees incurred if the option is exercised and the resulting short futures position offset by buying contract. Convert the total fees of all transactions to $/cwt by dividing by 400 cwt (size of one contract). This would give you a maximum fee and a conservative estimate on the price floor.

Equation 2. Calculating Approximate Price Floor, Ignoring Fees

Price Floor =
Put Option Strike Price + Expected Basis – Put Option Premium

In this case, using Equation 2 the price floor is calculated as:

$110 + (-$3) – $4 = **$103/cwt**

The feeder can expect to sell the live cattle for no less than $103/cwt, subject to basis risk. If prices rally, a higher selling price is possible. For the hedger, this ability to establish an approximate price floor is benefit of hedging with a put option. The benefit comes at a cost—the option premium.

Moving ahead to time of sale, Table 3 shows several price scenarios to understand how the put option functions as insurance against low prices and how basis impacts net price received.

Table 3. Possible Outcomes Using $110 Put Option if Basis Prediction is Correct

Live Cattle Cash ($/cwt)	Actual Basis ($/cwt)	Live Cattle Futures ($/cwt)	Option Gain ($/cwt)	Option Premium ($/cwt)	Net Price with Option ($/cwt)
$113	-$3	$116	$0	-$4	$109
$110	-$3	$113	$0	-$4	$ 106
$107	-$3	$110	$0	-$4	$103
$105	-$3	$108	$2	-$4	$103
$103	-$3	$106	$4	-$4	$103
$100	-$3	$103	$7	-$4	$103
$97	-$3	$100	$10	-$4	$103

The net price received is a function of cash price at the time of sale, any gain received from exercising the put option and the option premium.

Equation 3. Calculating Net Price Received, Ignoring Fees

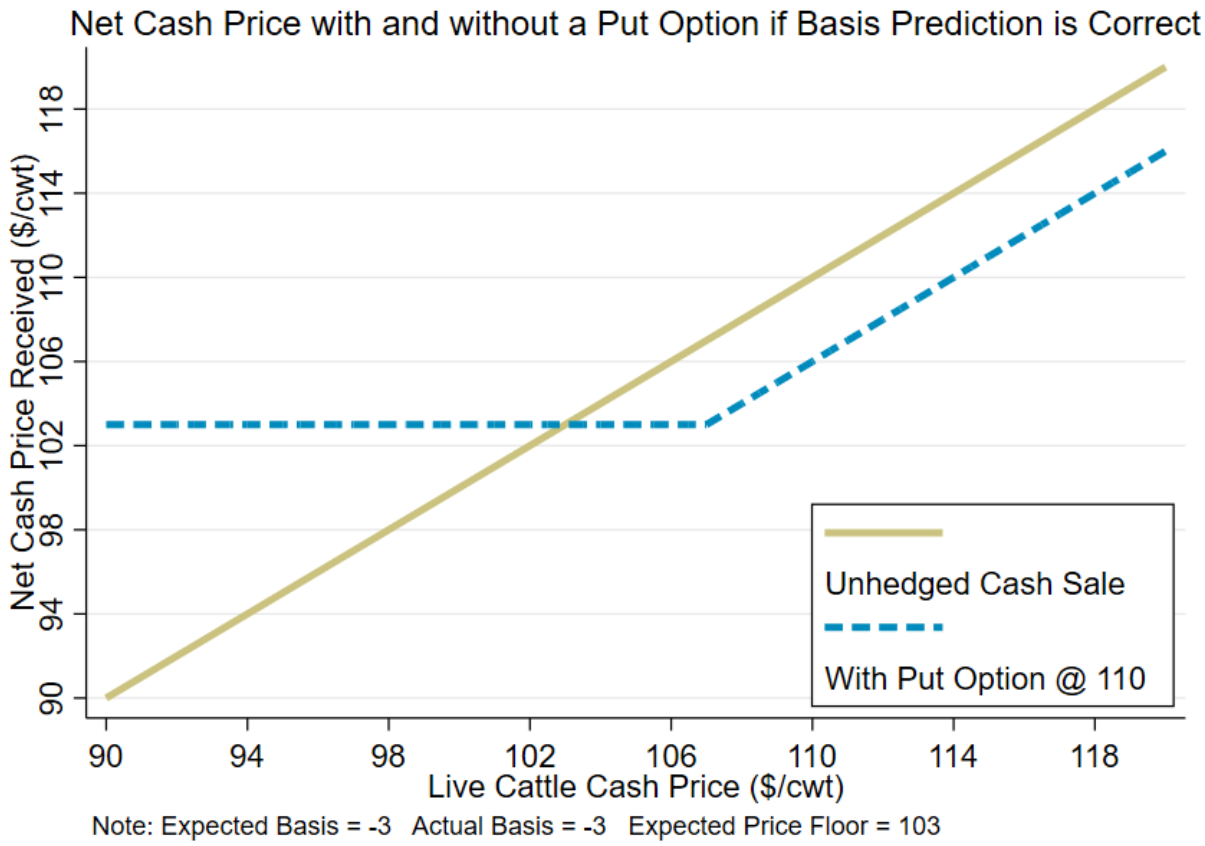
Net Price Received =
Live Cattle Cash Price + Gains From Exercising Put Option* – Put Option Premium

*If Futures Price > Put Option Strike then Gains = $0
If Futures Price < Put Option Strike then Gains = Strike – Futures Price

Equation 3 demonstrates how to calculate the net price received by the feeder in all the outcomes. Notice that the Option Premium never changes. That fee was paid in advance and is a cost in any outcome. What changes is the value of the put option. In high price scenarios, the put expires worthless. For example, when cash is $116 and futures is $113, having the right to sell futures at $110 has no value. As prices decrease, this changes. If futures price is less than $110 then exercising the option would bring a positive return. If futures price is $103 the option holder can establish short futures position of $110 then offset that by buying at the market price of $103 for a gain of $7/cwt. In this case, the feeder sells live cattle for $100/cwt and gains $7/cwt from exercising the option. The right to hold this option cost $4/cwt. $100 +$7 -$4 = $103. At lower prices, the value of the option increases. As a result, net price received never falls below the price floor of $103. Figure 1 shows the possible outcomes in the form of a payout chart. The tan line is Live Cattle Cash Price and the dashed blue line is Net Price Received with a Put Option. The function of the option is evident in the graph. The put option allows a seller to

benefit from a price rally but the cost of doing so is the option premium. When futures price is greater than strike price, the net price received with a put option is always less than unprotected cash sales by the amount of the option premium. In low price outcomes, net price received with a put option can be substantially more than unprotected cash as the price floor of $103/cwt holds.

Figure 1



Basis and Price Floor

In this example, the feeder exactly realized the established price floor because the basis prediction was correct. If actual basis differs from the predicted basis the realized price floor will be different. Table 4 shows how basis impacts price floor with constant cash price and different basis outcomes.

Table 4. Possible Outcomes Using $110 Put Option if Basis Prediction is Incorrect

Live Cattle Cash ($/cwt)	Actual Basis ($/cwt)	Live Cattle Futures ($/cwt)	Option Gain ($/cwt)	Option Premium ($/cwt)	Actual Price Floor ($/cwt)
$100	-$1	$101	$9	-$4	$105
$100	-$2	$102	$8	-$4	$104
$100	-$3	$103	$7	-$4	$103
$100	-$4	$104	$6	-$4	$102
$100	-$5	$105	$5	-$4	$101

Note: Expected Basis = -$3 and Approximate Price Floor = $103
Actual Price Floor Realized is also Net Price with Option and calculated using Equation 3

If basis is stronger than expected a higher price floor is established. A weaker basis means a less favorable price floor for the feeder. Just as in hedging with futures, understanding the basis your operation faces is key to hedging with options. Without an estimate for expected basis, it is not possible to calculate an expected price floor.

Value of Gain Outcomes

Demonstrating the math behind net prices is helpful to intuitively understand how options work. Perhaps a more instructive application is to scale the example up to hedging the value of gain (VOG) for the entire lot of cattle. None of the concepts change but thinking in terms of the total lot is probably a better decision-making process. We will use the information from Table 2 and assume there is no production risk such as death loss, disease, etc. Gains from feeding are shown in Table 5.

Table 5. Gain from Feeding

	Average Weight (lbs/head)	Head (head)	Total Live Weight (pounds)
Feeder Cattle Placed	800	30	24,000
Live Cattle at Sale Time	1,333	30	40,000
Gain	533		16,000

The feeder plans to have 40,000 pounds (400 cwt) of live cattle to market. If the feeder wants to hedge the entire lot, an option on one futures contract is needed. To calculate the entire premium for one contract, take the reported premium and multiply by contract size. In this case, that is $4/cwt x 400 cwt = $1,600. Protecting against downside price risk for this lot of cattle will cost the producer $1,600.

Table 6 reports the VOG realized with and with the protection of a put option. The right-most column of the table shows VOG with a put option minus VOG with no price protection. When Net Price with a Put Option is equal to Cash Price the two alternatives are the same. If Cash Price is $107 or higher VOG is $1,600 less with a put option. Again, this is the option premium. This important principle has been stated several times already—**the maximum cost of an option is its premium**. No market situation can change that.

Table 6. Possible Value of Gain (VOG) Outcomes Using $110 Put Option if Basis = -$3

Live Cattle Cash ($/cwt)	Unprotected Cash VOG ($/cwt)	Net Price with Put Option ($/cwt)	VOG with Put Option ($/cwt)	With Option – Cash
$113	$11,600	$109	$10,000	-$1,600
$110	$10,400	$ 106	$8,800	-$1,600
$107	$9,200	$103	$7,600	-$1,600
$105	$8,400	$103	$7,600	-$800
$103	$7,600	$103	$7,600	$0
$100	$6,400	$103	$7,600	$1,200
$97	$5,200	$103	$7,600	$2,400

Notes: Assuming 30 head of 800-lb feeders with all being fed to 1,333 lbs. See Table 5. VOG is value of all 30 head of live cattle minus cost of all 30 head of feeders.

Summary

In the case of selling live cattle, a put option on the CME Live Cattle Contract serves as insurance against low prices. Specifically, **a hedger can use a put option to establish a price floor that can be predicted, subject to basis risk.** In a market situation with higher prices, the hedger can receive a higher net price. The cost of this flexibility (avoiding low prices and benefiting from high prices) is the option premium.

Example 2: Hedging the Purchase of Feeder Cattle with a Call Option

In this example, a livestock producer is once again making decisions in late December. This time the plan is to purchase 65 feeder calves in March and expects the average weight to be about 770 pounds. The producer is concerned by the risk of feeder cattle price increasing in the interim. The producer can use a feeder cattle call option to hedge against this risk. The purchase is scheduled for March and will be for about 50,000 total live pounds. That means one call option on the March Feeder Cattle Contract is needed. Table 7 shows the market information at the time planning the purchase.

Table 7. Feeder Cattle Purchase Example: Three Months before Purchase

Feeder Cattle to be Purchased	
Feeder Average Weight	770 lbs
Head	65
Current Market Information	
Feeder Cattle Cash Price	$132/cwt
Feeder Cattle Futures Price	$137/cwt
Call Option Strike	$139/cwt
Call Option Premium	$4/cwt
Expected Basis at Sale Time	-$5/cwt

Using a call option results in establishing a price ceiling for the input in question. The approximate price ceiling is calculated by Equation 4:

Equation 4. Calculating Approximate Price Ceiling

Price Ceiling =
Call Option Strike Price + Expected Basis + Call Option Premium + Broker Fees

Since the purchase of an input is an outflow of cash, we add the premium and fees and show them as increasing the price of the input. Just as in the previous example, we will ignore broker fees to simplify things (Equation 5).

Equation 5. Calculating Approximate Price Ceiling, Ignoring Broker Fees

Price Ceiling =
Call Option Strike Price + Expected Basis + Call Option Premium

The producer can establish a price ceiling of $138/cwt:

$$\$139 + (-\$5) + 4 = \mathbf{\$138/cwt}$$

The producer can expect to buy the feeder cattle for no more than $138/cwt, subject to basis risk. If prices decline, a lower purchase price is possible. For the hedger, this ability to establish an approximate price ceiling is the benefit of hedging with a call option. The benefit comes at a cost—the option premium. That is $5/cwt and $2500 total ($5/cwt x 500 cwt contract).

At the time of purchase, the producer will purchase feeder calves on the cash market and, if it has value, exercise the call option. Possible outcomes over several cash prices are reported in Table 8. These assume actual basis at the time of sale is equal to the producer's expected basis when the option was bought.

Table 8. Possible Outcomes Using $139 Call Option if Basis Prediction is Correct

Feeder Cattle Cash ($/cwt)	Actual Basis ($/cwt)	Feeder Cattle Futures ($/cwt)	Option Gain ($/cwt)	Option Premium ($/cwt)	Net Price with Option ($/cwt)
$144	-$5	$149	$10	-$4	$138
$142	-$5	$147	$8	-$4	$138
$140	-$5	$145	$6	-$4	$138
$138	-$5	$143	$4	-$4	$138
$136	-$5	$141	$2	-$4	$138
$132	-$5	$137	$0	-$4	$136
$130	-$5	$135	$0	-$4	$134

Gains from the call option effectively reduce the price paid for feeder cattle. Net Price with a Call Option is calculated as:

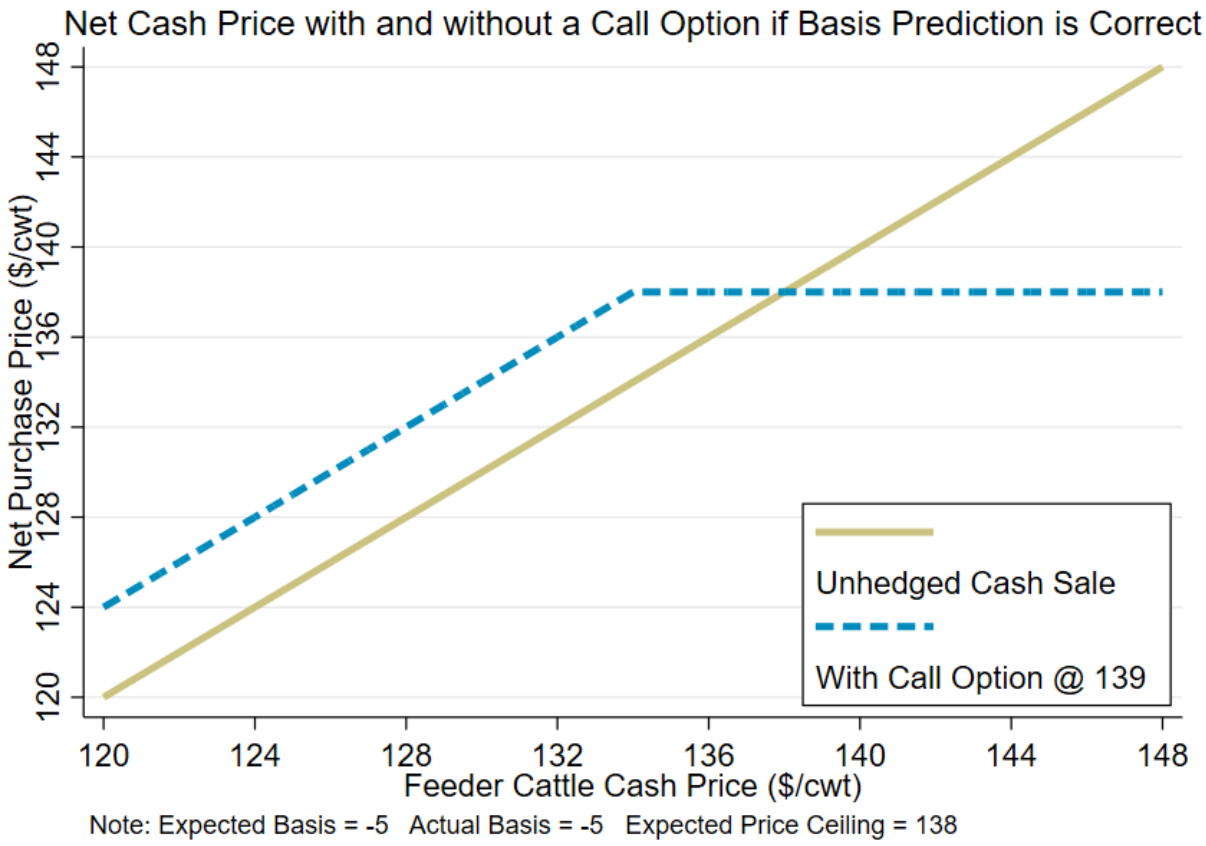
Equation 6. Calculating Net Price Received, Ignoring Fees

Net Price Received =
Live Cattle Cash Price - Gains From Exercising Call Option* + Put Option Premium

*If Futures Price is < Put Option Strike then Gains = $0
If Futures Price > Put Option Strike then Gains = Futures Price – Strike

As Equation 6 shows, the Call Option has value if futures price is greater than strike price. In these cases, the gains from the option ensure that net price paid is never more than $138/cwt. In cases where futures price is less than strike price the option is worthless. However, there is no penalty beyond the premium. At cash prices less than $138 (with basis = -$5), the producer's net price is always $4/cwt (the amount of the premium) more than unprotected cash price. The same information is shown in the payout chart in Figure 2.

Figure 2.



Basis and Price Ceiling

In this example, the hedger exactly realized the established price ceiling because the basis prediction was correct. If actual basis differs from the predicted basis the realized price ceiling will be different. Table 9 shows how basis impacts price ceiling with constant cash price and different basis outcomes.

Table 9. Possible Outcomes Using $139 Call Option if Basis Prediction is Incorrect

Feeder Cattle Cash ($/cwt)	Actual Basis ($/cwt)	Feeder Cattle Futures ($/cwt)	Option Gain ($/cwt)	Option Premium ($/cwt)	Actual Price Ceiling ($/cwt)
$142	-$3	$145	$6	-$4	$140
$142	-$4	$146	$7	-$4	$139
$142	-$5	$147	$8	-$4	$138
$142	-$6	$148	$9	-$4	$137
$142	-$7	$149	$10	-$4	$136

Note: Expected Basis = -$5 and Approximate Price Ceiling = $138
Actual Price Ceiling Realized is also Net Price with Option and calculated using Equation 6

If basis is weaker than expected a lower price ceiling is established. A stronger basis means a less favorable price ceiling. Just as in hedging with futures, understanding the basis your operation faces is key to hedging with options. Without an estimate for expected basis, it is not possible to estimate a price ceiling.

Summary

In the case of purchasing feeder cattle, a call option on the CME Feeder Cattle Contract serves as insurance against high prices. Specifically, **a hedger can use a call option to establish a price ceiling that can be predicted, subject to basis risk.** In a market situation with lower prices, the hedger can pay a lower net price. The cost of this flexibility (avoiding high prices and benefiting from low prices) is the option premium.

Some Practical Issues of Hedging with Options

The purpose of this paper is to introduce the idea of options on futures and how they can be used to hedge the purchase or sale of livestock. Once you have the concept of how an option on a futures contract works, the risk management potential is straightforward. However, the examples used here were simplified to avoid getting sidetracked with details. When you move on to actually using options as a risk management tool, there are some practical and technical matters that deserve attention. Some of these are listed below. There are no doubt other things you will learn as you buy and use options.

Insurance Mentality

When hedging with options, it is important to maintain an "insurance mentality". By that, I mean that you must remind yourself that you are buying insurance. Consider the Feeder Cattle Call Option example. If cash prices suddenly decline at purchase time, the producer who hedged with a call option will pay a higher net price for feeders than with no price protection. For many people, this seems like a failure. However, the options is insurance. Think about other forms of insurance. A reasonable person will buy home insurance, pay the premiums every year but never complain if their home stays safe and the insurance is not needed. The insurance did not fail. It was there if needed. Options are the same. They pay off when needed. Decide in advance if the premium is worth it for you to have the protection against extreme prices. Do not judge the effectiveness of options based on whether you exercise them or not.

Exercise vs. Sell

All the net prices in the examples in this paper were calculated assuming that an option is exercised. This is the case in almost all textbooks and educational materials. Another alternative that is available to option holders is to sell the option. That will offset the option purchase and leave you with no position in the options market. This is often a reasonable strategy. One situation where it would make sense is if you have purchased or sold your physical livestock but the option still has some time until expiration. For example, you are hedged with a March Feeder Cattle Call Option. You then buy cash feeder cattle on March 1st but the option has no intrinsic value. The option still has time value and likely can likely be sold for a small premium. If the premium you gain is greater than commission fees for the transaction the sale of the option will offset a small portion of the premium you paid. It is worth your time to check the option premiums at times like this to see if selling makes sense. A second case would be options that have intrinsic value and are very near expiration, the premium should be very near the intrinsic value. Even if the premium is less than the intrinsic value, you could be better off to sell the option than exercise. This is true since selling requires only one transaction and exercising will require three. You should compare the net gain from selling and exercising in these cases. If you are working with a full service broker, he or she can advise you on when exercising versus selling in specific situations.

Expiration

In the money options are automatically exercised unless a broker specifically declines to do so. This can be problematic is an option is just slightly in the money. It can be the case that the gains from exercises are less than the fees required to do so. In other words, there is a net loss from exercising. Depending on the service level broker you work with, it might be up to you to make sure you give instructions on when to avoid slightly in the money options from being exercised. Plan ahead and know how far in the money an option needs to be for exercising to be profitable.

Margin Calls

Another issue associated with exercising options is the margin call. Consider buying a put. Once you buy the put option, you are not required to keep any capital in your broker account. If you exercise that put then you establish a short position in a futures contract, which requires a margin. Plan ahead for these cases. In a true hedging approach, you should offset this short position by buying a futures contract immediately. Doing so should help you avoid needing to provide the margin for your futures positions. If you do not offset, margin capital is required.

Offsetting Positions

Textbooks define hedging with futures contracts as establishing equal and offsetting position in the cash and futures markets for a commodity. Hedging with options is no different. **To be fully hedged with options, you must have physical commodity and options on futures contracts for the same quantity of the commodity.** If you sell physical livestock and keep your option, you are then speculating in the options market. If you sell the option(s) and still have physical livestock, you are no longer hedged and are completely exposed to cash price risk.

Liquidity

Livestock futures contracts are not as heavily traded as some other agricultural commodities, such as corn. That means options on these contracts are also not as heavily traded. The situation is compounded by the fact that hedgers often need to buy options several months in advance. This will result in buying options on the second or third deferred contracts, which are more thinly traded than nearby contracts. If you need to buy several options at one time, care should be exercised. Work with your broker to understand how to mitigate the problems associated with this issue.

Contact Information

If you have questions or corrections, please contact:

Brian Coffey
Email: bcoffey@ksu.edu
Office Phone/Voicemail: 785-532-5033
Twitter: @BrianKCoffey