KLUIS
COMMODITY ADVISORS

OPTIONS 101

A DIVISION OF WEDBUSH FUTURES

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KLUIS COMMODITY ADVISORS

Futures and options trading involves the substantial risk of loss and is not suitable for all investors. Each investor must consider whether this is a suitable investment since you may lose all of or more than your initial investment. Past performance is not indicative of future results.

Many people new to investing tend to shy away from trading options because they believe that they are difficult to learn and require a tremendous knowledge of mathematics. However, this is only true in the most complex option strategies. Many individuals find that once they have a better grasp of the vocabulary associated with options, they are much more understandable and offer benefits that trading outright futures contracts do not.

What are Options?

An option is a contract that gives the buyer the right, but not the obligation, to go long (buy) or go short (sell) the underlying futures contract at a specific price on or before a set expiration date. Essentially, options on futures allow an investor to participate in futures price moves without having to actually purchase a futures contract. There are two different options: call and put options.

Call Options

Call options give the buyer the right, but not the obligation, to go long (buy) the underlying futures contract at a specific price on or before a set expiration date. Buyers of call options want the underlying futures contract to move higher.

Put Options

Put options give the buyer the right, but not the obligation, to go short (sell) the underlying futures contract at a specific price on or before a set expiration date. Buyers of put options want the underlying futures contracts to move lower.

Why Trade Options?

Trading options offers many advantages over trading outright futures contracts:

- **Limited risk when purchasing options** – when buying options on futures the most an investor can lose is the premium paid for the options contract plus the transaction costs.
- **Same opportunities as futures** – certain options strategies provide the same opportunities as futures.
- **Leverage** – with options an investor can gain the same amount of leverage as an outright futures contract.
- **Take advantage of any market condition** – rallies, breaks, or sideways, by using various option strategies investors can position themselves to take advantage of any market condition.
- **Protection** – options strategies can be used to hedge or protect other open positions.

Terminology of Options

Prior to trading options, it is important for investors to be familiar with several key terms associated with options:

Strike price: Strike price is the price at which the option buyer (holder) may buy (go long) or sell (go short) the underlying futures contract. Strike price is also referred to as the exercise price.

Premium: Premium is the amount paid by the options buyer (holder) to the options seller (writer) for the rights specified in

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the option contract. It is simply the option's current market price or value. This value is affected by a number of different factors including the difference between the strike price and the underlying futures price, time left until expiration, and the volatility of the underlying futures contract.

Expiration Date: Expiration date is the last day in which an option can be liquidated or exercised into an underlying futures position. After this date, the option contract will cease to exist.

Exercise: Exercise refers to the process in which an option buyer (holder) asserts their right to take a long or short position in the underlying futures contact. Only the buyer can exercise an option. If an option is exercised, the seller (writer) is obligated to take the opposite futures position of the option buyer (holder). It is because of this risk that the option seller (writer) receives the option premium.

Underlying Futures Contract: Underlying futures contract refers to the specific futures contract in which an investor will be assigned a position if the option is exercised.

Intrinsic Value: Intrinsic value refers to the amount by which an option is in-the-money. It is the value of the option if it were exercised today.

Time Value: Time value refers to the portion of an option's premium that is directly related to the amount of time left before expiration as well as the overall volatility of the underlying futures contract. It is the amount by which an option's price exceeds the intrinsic value.

Break-even Point: Break-even point refers to the price that the underlying futures contract must reach in order to avoid a loss if the option is exercised.

In-the-money: In-the-money refers to the above situation in which the underlying futures price is above the call option's strike price or the underlying futures price is below the put option's strike price. When an option is in-the-money, it does not necessarily mean the investor will profit from the position. It simply means that the option has intrinsic value.

At-the-money: At-the-money refers to the situation in which the option's strike price is the same as the underlying futures contract price.

Out-of-the-money: Out-of-the-money refers to the situation in which a call option's strike price is above the underlying futures prices or a put option's strike price is below the underlying futures price. An option that is out-of-the-money has no intrinsic value, only time value.

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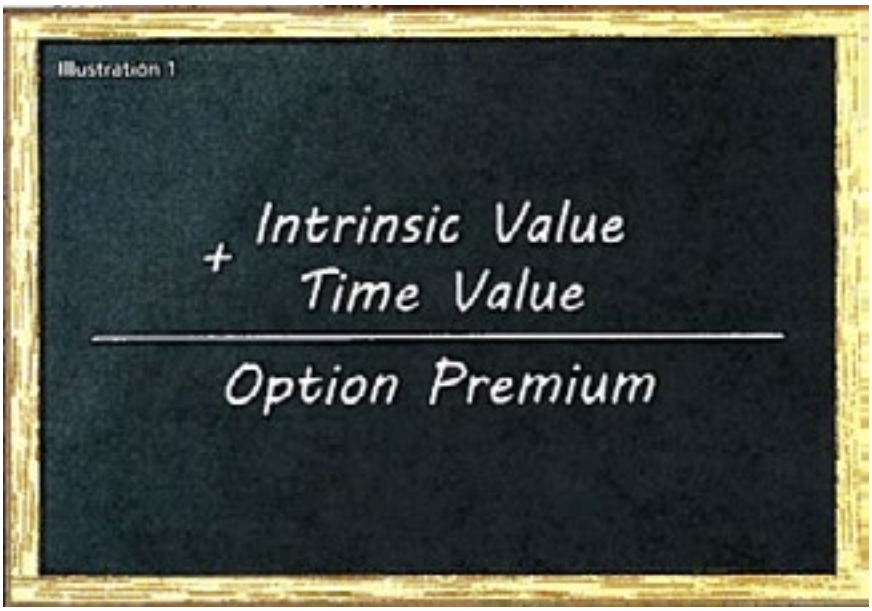
Understanding Basic Option Pricing

Before venturing into the world of trading options on futures, investors should have a basic understanding of the factors composing an option's premium. When dissecting premium, the majority of people break it down into two general categories: intrinsic value and time value. Therefore, once an investor knows both the intrinsic value and the time value of the option contract the following equation can be used to calculate the option's premium. (Illustration 1)



Intrinsic Value

As mentioned above, intrinsic value is the amount by which an option is in-the-money. It is important to note that intrinsic value cannot be negative. Thus, options trading at-the-money or out-of-the-money have an intrinsic value of zero.

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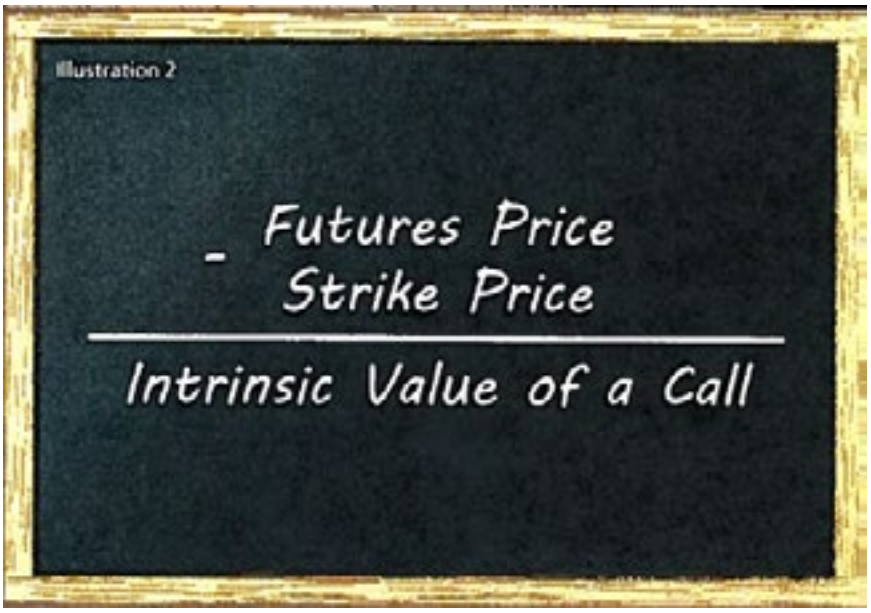
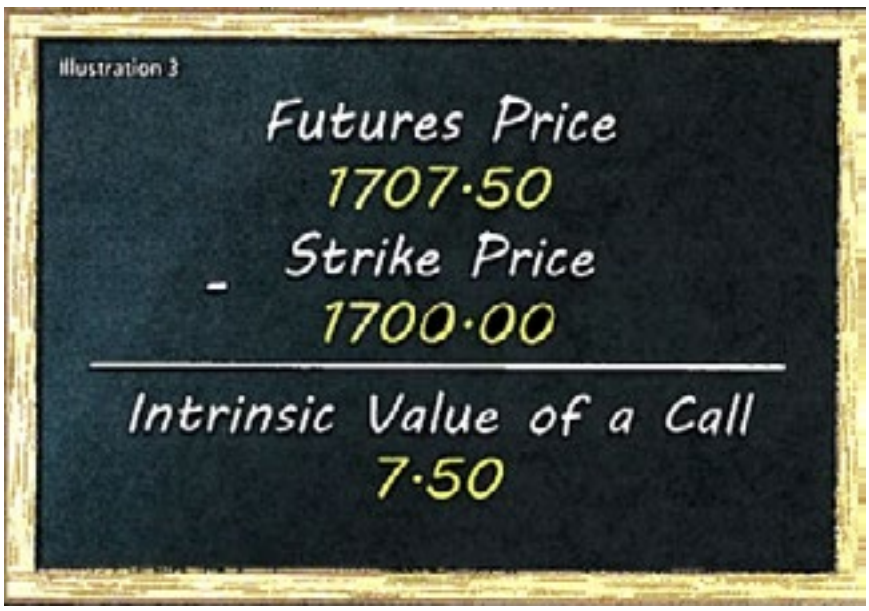
Calculating the Intrinsic Value of Call Options

With regard to calls, intrinsic value is the amount by which the underlying futures price exceeds the strike price. The equation to the right can be used to calculate intrinsic value of a call. (Illustration 2)



Example:

Let's say a trader is long 1 April gold $1700 call and April gold futures are currently trading at $1707.50 per troy ounce. What is the intrinsic value of the call option? (Illustration 3)



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Calculating the Intrinsic Value of Put Options

With regard to puts, intrinsic value is the amount by which the underlying futures price is below the strike price. The equation to the right can be used to calculate the intrinsic value of a put. (Illustration 4)

Example:

Let's say a trader is long 1 June crude oil $110.00 put and June crude oil futures are currently trading at $107.45 per barrel. What is the intrinsic value of the put option? (Illustration 5)

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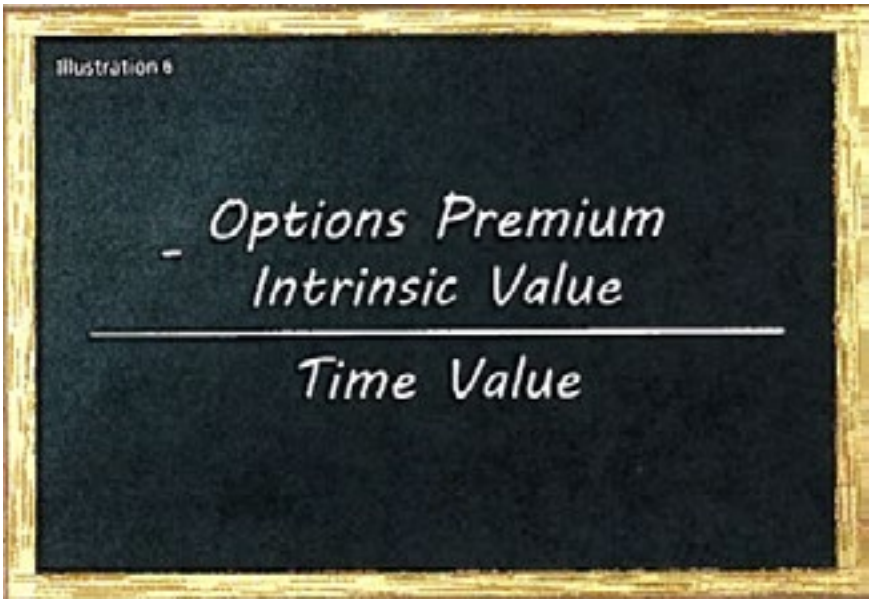
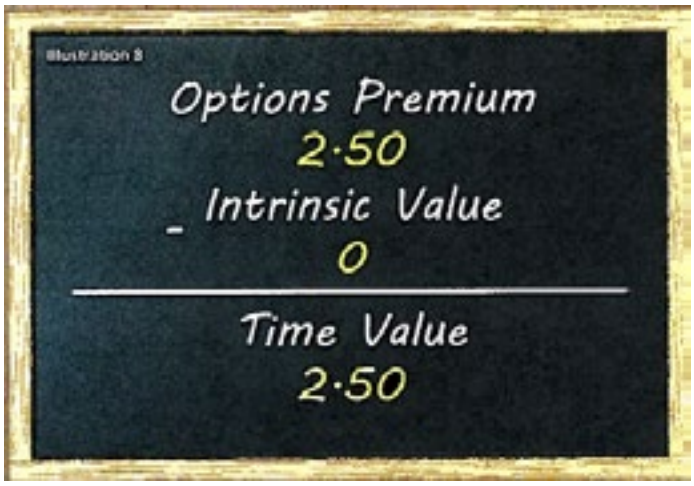
Time Value

Time value is the amount by which the option's price exceeds the intrinsic value. As mentioned above, it accounts for the amount of premium that is directly related to the amount of time left before expiration as well as the volatility of the underlying futures contract. The more time an option has before expiration the greater the likelihood it will end up in-the-money. As more time passes, an option's time value decays exponentially until reaching zero at expiration. As a general rule of thumb, an option will lose one-third of its time value during the first half of its life and the remaining two-thirds during the second half. The equation below can be used to calculate the time value of an option contract. (Illustration 6)



Example:

Let's say April live cattle are currently trading at $125.00 per contract and April 125 calls are currently at 2.50. What is the time value of the call option? (Illustrations 7 & 8)



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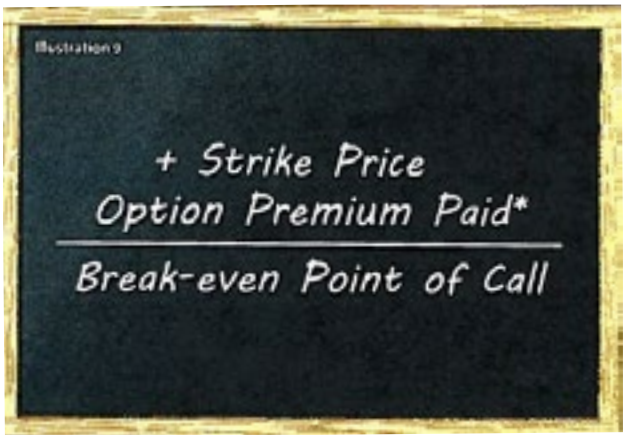
Calculating Break-Even

As mentioned above, the break-even point is the price that the underlying futures contract must reach in order to avoid a loss if the option is exercised. While options are versatile instruments that allow the buyer to participate in market fluctuations, it is imperative that an investor is able to calculate their break-even point prior to engaging in options trading. By calculating the break-even point of any given option position before entering, it assists the trader in evaluating and choosing the most appropriate strategy for success. To calculate break-even, traders simply need to know the strike price and the premium paid for the option.*

Calculating the Break-Even Point of Call Options

This equation can be used for calculating the break-even point of a call option. (Illustration 9)



Example:

An investor purchases a December corn $6.00 call and pays a premium of $0.30. Calculate the break-even point of the option position. (Illustration 10)

In this example, the December corn futures would need to rise to $6.30 per bushel in order for the trader to break-even on the position.

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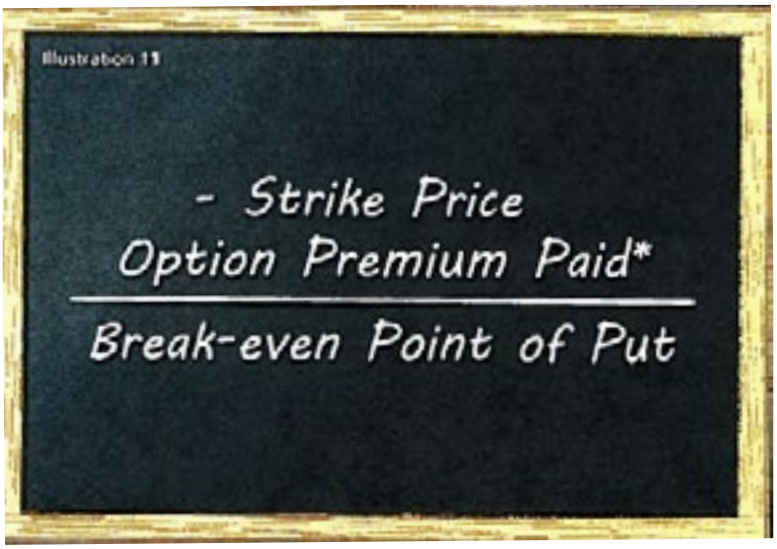
Calculating the Break-Even on Put Options



The above equation can be used for calculating the break-even point of a put option. (Illustration 11)

Example:

An investor purchases a June E-Mini S&P 1200 put and pays a premium of 14.50. Calculate the break-even point of the position. (Illustration 12)

In this example, the June E-Mini S&P 500 futures would need to drop to 1185.50 in order for the trader to break-even on the position.

**Traders should also include in their break-even calculations any transaction costs paid as a result of the trade.*

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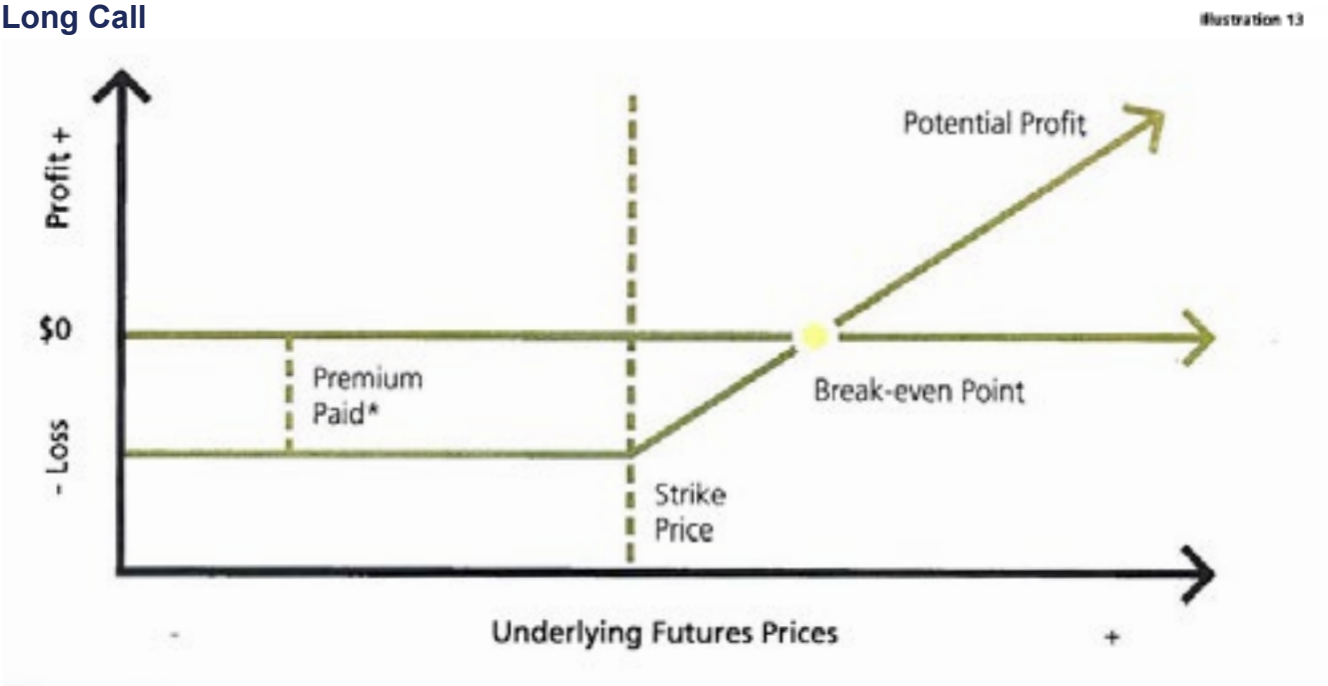
Long Call



Basic Option Strategies

Buying (or going long) call options is a bullish options strategy a trader can use. A long call gives investors the right to purchase the underlying futures contract at a specific price (strike price) on or before a set date (expiration date). Long puts offer the investor a limited risk with similar profit potential as the underlying futures contract. On a long call strategy, the investor only risks the premium paid for the option contract plus the transaction costs. The call option increases in value as the underlying futures price increases. (Illustration 13)

When to Use

Investors should consider the use of long call options when they believe a futures contract is set for a short-tern rise in price. Buying call options is a bullish strategy.

**Traders should also include their break-even calculations any transaction costs paid as a result of the trade.*

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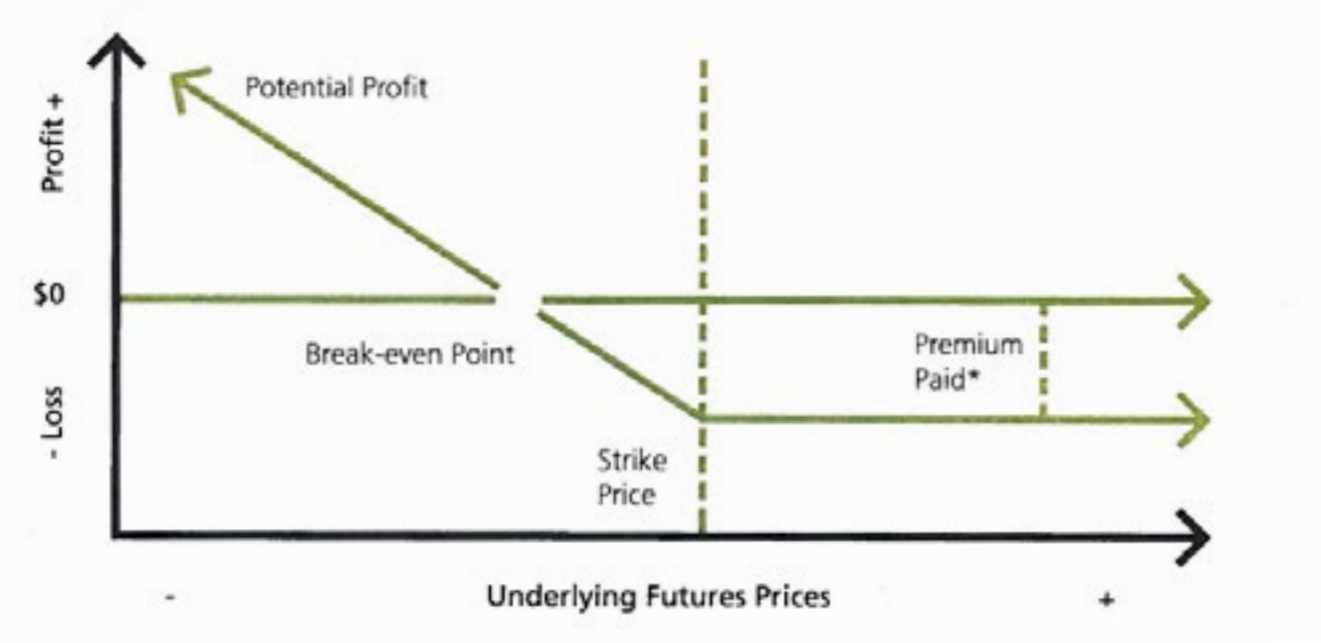
Long Put

Illustration 14



Basic Option Strategies

Buying (or going long) put options is a bearish options strategy a trader can use. A long put gives investors the right to sell the underlying futures contract at a specific price (strike price) on or before a set date (expiration date). Long puts offer the investor a limited risk with similar potential as the underlying futures contract. On a long put strategy, the investor only risks the premium paid for the option plus the transaction costs. The put option increases in value as the underlying futures price decreases. (Illustration 14)

When to Use

Investors should consider the use of long put options when they believe a futures contract is set for a short-term drop in price. Buying put options is a bearish market strategy.

**Traders should also include in their break-even calculations any transaction costs paid as a result of the trade.*

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CME Group

AGRICULTURAL PRODUCTS

Self-Study Guide to Hedging with Grain and Oilseed Futures and Options

In a world of increasing volatility, CME Group is where the world comes to manage risk across all major asset classes – interest rates, equity indexes, foreign exchange, energy, agricultural commodities, metals, and alternative investments like weather and real estate. Built on the heritage of CME, CBOT and NYMEX, CME Group is the world's largest and most diverse derivatives exchange encompassing the widest range of benchmark products available. CME Group brings buyers and sellers together on the CME Globex electronic trading platform. We provide you with the tools you need to meet your business objectives and achieve your financial goals. CME Clearing matches and settles all trades and provides significant financial resources, which enhance the creditworthiness of every transaction that takes place in our markets.

AGRICULTURAL PRODUCTS

MORE AGRICULTURAL FUTURES AND OPTIONS. GREATER OPPORTUNITY.

CME Group offers the widest range of agricultural derivatives of any exchange, with trading available on a variety of grains, oilseeds, livestock, dairy, lumber and other products. Representing the staples of everyday life, these products offer you liquidity, transparent pricing and extraordinary opportunities in a regulated centralized marketplace with equal access for all participants.

IN THIS GUIDE

INTRODUCTION

Futures and options on agricultural commodities have been seeing phenomenal growth in trading volume in recent years, due to increased global demand and the expanded availability of electronic trading for these products. It is now more important than ever to understand how to incorporate these tools into the management of risk.

This booklet is designed to help participants in the grain and oilseed markets learn how to integrate futures and options into effective hedging strategies. As a self-study guide, it also includes a quiz at the end of each chapter to allow you to test your grasp of the material.

If you're new to futures and options on futures, the first four chapters will give you a solid foundation. Chapters 5 and 6 include futures and options hedging strategies, both from a buying and selling hedger's perspective.

We hope you enjoy this booklet and that it answers many of your questions. In addition to reading on your own, your broker should be a primary source of information. The kind of assistance you may get from your broker ranges from access to research reports, analysis and market recommendations, to assistance in fine-tuning and executing your trading strategies. A principal objective of this guide is to better enable you to use such assistance effectively.

CHAPTER 1 THE MARKETS

Before you can begin to understand options on futures, you must know something about futures markets. This is because futures contracts are the underlying instruments on which the options are traded. And, as a result, option prices – referred to as premiums – are affected by futures prices and other market factors.

In addition, the more you know about the markets, the better equipped you will be, based on current market conditions and your specific objectives, to decide whether to use futures contracts, options on futures contracts, or other risk management and pricing alternatives.

CME Group itself does not in any way participate in the process of price discovery. It is neither a buyer nor a seller of futures contracts, so it doesn't have a role or interest in whether prices are high or low at any particular time. The role of the exchange is simply to provide a central marketplace for buyers and sellers. It is in this marketplace where supply and demand variables from around the world come together to discover price.

CME Group combines the histories of two groundbreaking marketplaces for trading futures and options, the Chicago Board of Trade and the Chicago Mercantile Exchange.

Formed in 1848, the Chicago Board of Trade was the first marketplace to sell a forward contract. The first 3,000 bushels of forward-traded corn in 1851 would spark the development of standardized commodity futures contracts in 1865 by the CBOT. The CBOT also began that year to require performance bonds or "margin" to be posted by buyers and sellers in its grain markets, a move that eventually led to the conceptualization and development of the futures clearing house in 1925.

Initially, CBOT's products focused on the primary grains of that era; corn, wheat and oats and eventually launching soybean futures in 1936 and the soybean meal and oil in the 1950s. But the scope of CBOT's product expanded in 1969 when they launched their first non-agricultural product: a silver futures contract. CBOT's foray into new futures fields continued in 1975, when they launched the first interest rate futures, offering a contract on the Government National Mortgage Association.

Just a few blocks away, another exchange was formed and grew into a formidable rival to the CBOT – the Chicago Mercantile Exchange. Originally dubbed the Chicago Butter and Egg Board when it opened in 1898, the newer exchange adopted the CME name in 1919.

To hold its own against its sizeable competitor, CME began breaking ground with cutting-edge products and services. The same year that CME took its official name, the CME Clearing house was established, guaranteeing every trade performed on CME's floor. In 1961, CME launched the first futures contract on frozen, stored meat with frozen pork bellies.

In 1972, CME launched the first financial futures, offering contracts on seven foreign currencies. In the 1980s, CME launched not only the first cash-settled futures contract with Eurodollar futures, but also launched the first successful stock index futures contract, the S&P 500 index, which continues to be a benchmark for the stock market today.

Two very important innovations for the futures industry occurred during 1980s and 1990s – Commodity options and electronic trading. CME's conceptualization and initiation of electronic trading occurred with the development of the CME Globex electronic trading platform. The first electronic trade on CME Globex in 1992 marked the still-ongoing transition from floor based trading to trading electronically.

Then, in 2002, CME became the first exchange to go public, its stock listed on the New York Stock Exchange. CBOT followed suit in 2005.

While the two companies had flirted with the idea of merging in earlier years, 2007 marked the year of a monumental merger between the two derivatives powerhouses. The two companies united under the name CME Group on July 9.

In 2012 CME Group introduced Black Sea Wheat futures and acquired the Kansas City Board of Trade. This addition of Black Sea Wheat and KC Hard Red Winter (HRW) Wheat products allows us to address the world's most critical wheat trading needs in one efficient marketplace.

Currently, CME Group is the world's leading and most diverse derivatives exchange, offering futures and options on the widest range of benchmark products available on any exchange. With a collective history of innovation, including the birth of futures trading, CME Group is responsible for key developments that have built today's futures industry.

The Futures Contract

A futures contract is a commitment to make or take delivery of a specific quantity and quality of a given commodity at a specific delivery location and time in the future. All terms of the contract are standardized except for the price, which is discovered via the supply (offers) and the demand (bids). This price discovery process occurs through an exchange's electronic trading system.

All contracts are ultimately settled either through liquidation by an offsetting transaction (a purchase after an initial sale or a sale after an initial purchase) or by delivery of the actual physical commodity. An offsetting transaction is the more frequently used method to settle a futures contract. Delivery usually occurs in less than 2 percent of all agricultural contracts traded.

Exchange Functions

The main economic functions of a futures exchange are price risk management and price discovery. An exchange accomplishes these functions by providing a facility and trading platforms that bring buyers and sellers together. An exchange also establishes and enforces rules to ensure that trading takes place in an open and competitive environment. For this reason, all bids and offers must be made either via the exchange's electronic order-entry trading system, such as CME Globex.

As a customer, you have the right to choose which trading platform you want your trades placed on. You can make electronic trades directly through your broker or with pre-approval from your broker. Technically, all trades are ultimately made by a member of the exchange. If you are not a member, you will work through a commodity broker, who may be an exchange member or, if not, will in turn work with an exchange member.

Can a futures price be considered a price prediction? In one sense, yes, because the futures price at any given time reflects the price expectations of both buyers and sellers for a time of delivery in the future. This is how futures prices help to establish a balance between production and consumption. But in another sense, no, because a futures price is a price prediction subject to continuous change. Futures prices adjust to reflect additional information about supply and demand as it becomes available.

Market Participants

Futures market participants fall into two general categories: hedgers and speculators. Futures markets exist primarily for hedging, which is defined as the management of price risks inherent in the purchase or sale of commodities.

The word hedge means protection. The dictionary states that to hedge is "to try to avoid or lessen a loss by making counterbalancing investments ..." In the context of futures trading, that is precisely what a hedge is: a counterbalancing transaction involving a position in the futures market that is opposite one's current position in the cash market. Since the cash market price and futures market price of a commodity tend to move up and down together, any loss or gain in the cash market will be roughly offset or counterbalanced in the futures market.

Hedgers include:

- Farmers, livestock producers – who need protection against declining prices for crops or livestock, or against rising prices of purchased inputs such as feed
- Merchandisers, elevators – who need protection against lower prices between the time they purchase or contract to purchase grain from farmers and the time it is sold
- Food processors, feed manufacturers – who need protection against increasing raw material costs or against decreasing inventory values
- Exporters – who need protection against higher prices for grain contracted for future delivery but not yet purchased
- Importers – who want to take advantage of lower prices for grain contracted for future delivery but not yet received

Since the number of individuals and firms seeking protection against declining prices at any given time is rarely the same as the number seeking protection against rising prices, other market participants are needed. These participants are known as speculators.

Speculators facilitate hedging by providing market liquidity – the ability to enter and exit the market quickly, easily and efficiently. They are attracted by the opportunity to realize a profit if they prove to be correct in anticipating the direction and timing of price changes.

These speculators may be part of the general public or they may be professional traders including members of an exchange trading on the electronic platform. Some exchange members are noted for their willingness to buy and sell on even the smallest of price changes. Because of this, a seller or buyer can enter and exit a market position at an efficient price.

Financial Integrity of Markets

Performance bond, or margin, in the futures industry, is money that you as a buyer or seller of futures contracts must deposit with your broker and that brokers in turn must deposit with a clearing house. If you trade CME Group products, your trades will clear through CME Clearing. These funds are used to ensure contract performance, much like a performance bond. This differs from the securities industry, where margin is simply a down payment required to purchase stocks and bonds. As a result of the margin process, buyers and sellers of CME Group's products do not have to worry about contract performance.

The amount of performance bond/margin a customer must maintain with their brokerage firm is set by the firm itself, subject to certain minimum levels established by the exchange where the contract is traded. If a change in the futures price results in a loss on an open futures position from one day to the next, funds will be withdrawn from the customer's margin account to cover the loss. If a customer must deposit additional money in the account to comply with the performance bond/margin requirements it is known as receiving a margin call.

On the other hand, if a price change results in a gain on an open futures position, the amount of gain will be credited to the customer's margin account. Customers may make withdrawals from their account at any time, provided the withdrawals do not reduce the account balance below the required minimum. Once an open position has been closed by an offsetting trade, any money in the margin account not needed to cover losses or provide performance bond for other open positions may be withdrawn by the customer.

Just as every trade is ultimately executed by or through an exchange member, every trade is also cleared by or through a clearing member firm.

In the clearing operation, the connection between the original buyer and seller is severed. CME Clearing assumes the opposite side of each open position and thereby provides the financial integrity of every futures and options contract traded at CME Group.

This assurance is accomplished through the mechanism of daily cash settlements. Each day, CME Clearing determines the gain or loss on each trade. It then calculates total gains or losses on all trades cleared by each clearing member firm. If a firm has incurred a net loss for the day, their account is debited and the firm may be required to deposit additional margin with the clearing house. Conversely, if the firm has a net gain for the day, the firm receives a credit to its account. The firm then credits or debits each individual customer account.

QUIZ 1

1. **Futures contracts are:**
   - (a) the same as forward contracts
   - (b) standardized contracts to make or take delivery of commodity at a predetermined place and time
   - (c) contracts with standardized price terms
   - (d) all of the above

2. **Futures prices are discovered by:**
   - (a) bids and offers
   - (b) officers and directors of the exchange
   - (c) written and sealed bids
   - (d) CME Clearing
   - (e) both (b) and (d)

3. **The primary function of CME Clearing is to:**
   - (a) prevent speculation in futures contracts
   - (b) ensure the financial integrity of the contracts traded
   - (c) clear every trade made at the CME Group
   - (d) both (b) and (c)

4. **Gains and losses on futures positions are settled:**
   - (a) by signing promissory notes
   - (b) each day after the close of trading
   - (c) within five business days
   - (d) directly between the buyer and seller
   - (e) none of the above

5. Speculators:

(a) assume market price risk while looking for profit opportunities

(b) add to market liquidity

(c) aid in the process of price discovery

(d) facilitate hedging

(e) all of the above

6. Hedging involves:

(a) taking a futures position opposite to one's current cash market position

(b) taking a futures position identical to one's current cash market position

(c) holding only a futures market position

(d) holding only a cash market position

(e) none of the above

7. Margins in futures trading:

(a) serve the same purpose as margins for common stock

(b) are greater than the value of the futures contract

(c) serve as a down payment

(d) serve as a performance bond

(e) are required only for long positions

8. You may receive a margin call if:

(a) you have a long (buy) futures position and prices increase

(b) you have a long (buy) futures position and prices decrease

(c) you have a short (sell) futures position and prices increase

(d) you have a short (sell) futures position and prices decrease

(e) both (a) and (d)

(f) both (b) and (c)

9. Margin requirements for customers are established by:

(a) the Federal Reserve Board

(b) the Commodity Futures Trading Commission

(c) the brokerage firms, subject to exchange minimums

(d) the Clearing Service Provider

(e) private agreement between buyer and seller

10. Futures trading gains credited to a customer's margin account can be withdrawn by the customer:

(a) as soon as the funds are credited

(b) only after the futures position is liquidated

(c) only after the account is closed

(d) at the end of the month

(e) at the end of the year

See the answer guide at the back of this book.

CHAPTER 2
HEDGING WITH FUTURES AND BASIS

Hedging is based on the principle that cash market prices and futures market prices tend to move up and down together. This movement is not necessarily identical, but it usually is close enough that it is possible to lessen the risk of a loss in the cash market by taking an opposite position in the futures market. Taking opposite positions allows losses in one market to be offset by gains in the other. In this manner, the hedger is able to establish a price level for a cash market transaction that may not actually take place for several months.

The Short Hedge

To give you a better idea of how hedging works, let's suppose it is May and you are a soybean farmer with a crop in the field; or perhaps an elevator operator with soybeans you have purchased but not yet sold. In market terminology, you have a long cash market position. The current cash market price for soybeans to be delivered in October is $12.00 per bushel. If the price goes up between now and October, when you plan to sell, you will gain. On the other hand, if the price goes down during that time, you will have a loss.

To protect yourself against a possible price decline during the coming months, you can hedge by selling a corresponding number of bushels in the futures market now and buying them back later when it is time to sell your crops in the cash market. If the cash price declines by harvest, any loss incurred will be offset by a gain from the hedge in the futures market. This particular type of hedge is known as a short hedge because of the initial short futures position.

With futures, a person can sell first and buy later or buy first and sell later. Regardless of the order in which the transactions occur, buying at a lower price and selling at a higher price will result in a gain on the futures position.

Selling now with the intention of buying back at a later date gives you a short futures market position. A price decrease will result in a futures gain, because you will have sold at a higher price and bought at a lower price.

For example, let's assume cash and futures prices are identical at $12.00 per bushel. What happens if prices decline by $1.00 per bushel? Although the value of your long cash market position decreases by $1.00 per bushel, the value of your short futures market position increases by $1.00 per bushel. Because the gain on your futures position is equal to the loss on the cash position, your net selling price is still $12.00 per bushel.

	Cash market	Futures market
May	cash Soybeans are $12.00/bu	sell Nov Soybean futures at $12.00/bu
Oct	sell cash Soybeans at $11.00/bu	buy Nov Soybean futures at $11.00/bu
change	$1.00/bu loss	$1.00/bu gain

sell cash Soybeans at	**$11.00/bu**
gain on futures position	+ **$1.00/bu**
net selling price	**$12.00/bu**

Note: When hedging, you use the futures contract month closest to the time, but not before you plan to purchase or sell the physical commodity.

*Does not include transaction fees.

What if soybean prices had instead risen by $1.00 per bushel? Once again, the net selling price would have been $12.00 per bushel, as a $1.00 per bushel loss on the short futures position would be offset by a $1.00 per bushel gain on the long cash position.

Notice in both cases the gains and losses on the two market positions cancel each other out. That is, when there is a gain on one market position, there is a comparable loss on the other. This explains why hedging is often said to "lock in" a price level.

	Cash market	Futures market
May	cash Soybeans are $12.00/bu	sell Nov Soybean futures at $12.00/bu
Oct	sell cash Soybeans at $13.00/bu	buy Nov Soybean futures at $13.00/bu
change	$1.00/bu gain	$1.00/bu loss
	sell cash Soybeans at	**$13.00/bu**
	loss on futures position +	**$1.00/bu**
	net selling price	**$12.00/bu**

In both instances, the hedge accomplished what it set out to achieve: It established a selling price of $12.00 per bushel for soybeans to be delivered in October. With a short hedge, you give up the opportunity to benefit from a price increase to obtain protection against a price decrease.

The Long Hedge

On the other hand, livestock feeders, grain importers, food processors and other buyers of agricultural products often need protection against rising prices and would instead use a long hedge involving an initial long futures position.

For example, assume it is July and you are planning to buy corn in November. The cash market price in July for corn delivered in November is $6.50 per bushel, but you are concerned that by the time you make the purchase, the price may be much higher. To protect yourself against a possible price increase, you buy Dec Corn futures at $6.50 per bushel. What would be the outcome if corn prices increase 50 cents per bushel by November?

	Cash market	Futures market
Jul	cash Corn is $6.50/bu	buy Dec Corn futures at $6.50/bu
Nov	buy cash Corn at $7.00/bu	sell Dec Corn futures at $7.00/bu
change	$.50/bu loss	$.50/bu gain
	buy cash Corn at	**$7.00/bu**
	gain on futures position +	**$.50/bu**
	net purchase price	**$6.50/bu**

In this example, the higher cost of corn in the cash market was offset by a gain in the futures market.

Conversely, if corn prices decreased by 50 cents per bushel by November, the lower cost of corn in the cash market would be offset by a loss in the futures market. The net purchase price would still be $6.50 per bushel.

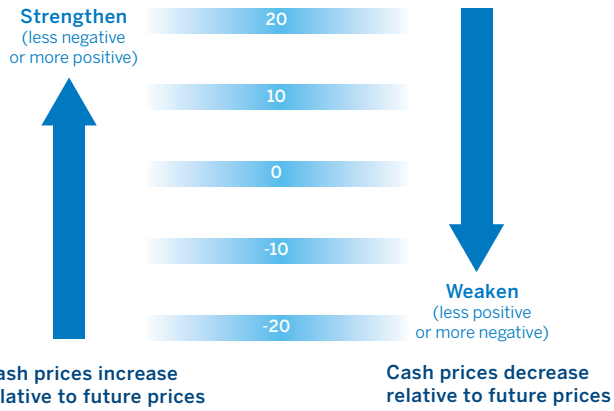
	Cash market	Futures market
Jul	cash Corn is $6.50/bu	buy Dec Corn futures at $6.50/bu
Nov	buy cash Corn at $6.00/bu	sell Dec Corn futures at $6.00/bu
change	$.50/bu gain	$.50/bu loss
	buy cash Corn at	**$6.00/bu**
	loss on futures position +	**$.50/bu**
	net purchase price	**$6.50/bu**

Remember, whether you have a short hedge or a long hedge, any losses on your futures position may result in a margin call from your broker, requiring you to deposit additional funds to your performance bond account. As previously discussed, adequate funds must be maintained in the account to cover day-to-day losses. However, keep in mind that if you are incurring losses on your futures market position, then it is likely that you are incurring gains on your cash market position.

Basis: The Link Between Cash and Futures Prices

All of the examples just presented assumed identical cash and futures prices. But, if you are in a business that involves buying or selling grain or oilseeds, you know the cash price in your area or what your supplier quotes for a given commodity usually differs from the price quoted in the futures market. Basically, the local cash price for a commodity is the futures price adjusted for such variables as freight, handling, storage and quality, as well as the local supply and demand factors. The price difference between the cash and futures prices may be slight or it may be substantial, and the two prices may not always vary by the same amount.

This price difference (cash price – futures price) is known as the basis.



A primary consideration in evaluating the basis is its potential to strengthen or weaken. The more positive (or less negative) the basis becomes, the stronger it is. In contrast, the more negative (or less positive) the basis becomes, the weaker it is.

For example, a basis change from 50 cents under (a cash price 50 cents less than the futures price) to a basis of 40 cents under (a cash price 40 cents less than the futures price) indicates a strengthening basis, even though the basis is still negative. On the other hand, a basis change from 20 cents over (a cash price 20 cents more than the futures price) to a basis of 15 cents over (a cash price 15 cents more than the futures price) indicates a weakening basis, despite the fact that the basis is still positive. (Note: Within the grain industry a basis of 15 cents over or 15 cents under a given futures contract is usually referred to as "15 over" or "15 under." The word "cents" is dropped.) Basis is simply quoting the relationship of the local cash price to the futures price.

Basis and the Short Hedger

Basis is important to the hedger because it affects the final outcome of a hedge. For example, suppose it is March and you plan to sell wheat to your local elevator in mid-June. The July Wheat futures price is $6.50 per bushel, and the cash price in your area in mid-June is normally about 35 under the July futures price. Note that in this example, and other examples in this brochure, you would use either Chicago Soft Red Winter (SRW) Wheat futures or KC HRW Wheat futures, depending upon the type of wheat you are hedging.

	Cash market	Futures market	Basis
Mar	expected cash Wheat price is $6.15/bu	sell Jul Wheat futures at $6.50/bu	–.35
Jun	sell cash Wheat at $5.65/bu	buy Jul Wheat futures at $6.00/bu	–.35
change	$.50/bu loss	$.50/bu gain	0
		sell cash Wheat at	**$5.65/bu**
		gain on futures position	+ **$.50/bu**
		net selling price	**$6.15/bu**

The approximate price you can establish by hedging is $6.15 per bushel ($6.50 – $.35) provided the basis is 35 under. The previous table shows the results if the futures price declines to $6.00 by June and the basis is 35 under.

Suppose, instead, the basis in mid-June had turned out to be 40 under rather than the expected 35 under. Then the net selling price would be $6.10, rather than $6.15.

	Cash market	Futures market	Basis
Mar	expected cash Wheat price is $6.15/bu	sell Jul Wheat futures at $6.50/bu	–.35
Jun	sell cash Wheat at $5.60/bu	buy Jul Wheat futures at $6.00/bu	–.40
change	$.55/bu loss	$.50/bu gain	.05 loss
		sell cash Wheat at	**$5.60/bu**
		gain on futures position +	**$.50/bu**
		net selling price	**$6.10/bu**

This example illustrates how a weaker-than-expected basis reduces your net selling price. And, as you might expect, your net selling price increases with a stronger-than-expected basis. Look at the following example.

As explained earlier, a short hedger benefits from a strengthening basis. This information is important to consider when hedging. That is, as a short hedger, if you like the current futures price and expect the basis to strengthen, you should consider hedging a portion of your crop or inventory as shown in the next table. On the other hand, if you expect the basis to weaken and would benefit from today's prices, you might consider selling your commodity now.

	Cash market	Futures market	Basis
Mar	expected cash Wheat price is $6.15/bu	sell Jul Wheat futures at $6.50/bu	–.35
Jun	sell cash Wheat at $5.75/bu	buy Jul Wheat futures at $6.00/bu	–.25
change	$.40/bu loss	$.50/bu gain	.10 gain
		sell cash Wheat at	**$5.75/bu**
		gain on futures position +	**$.50/bu**
		net selling price	**$6.25/bu**

Basis and the Long Hedger

How does basis affect the performance of a long hedge? Let's look first at a livestock feeder who in October is planning to buy soybean meal in April. May Soybean Meal futures are $350 per ton and the local basis in April is typically $20 over the May futures price, for an expected purchase price of $370 per ton ($350 + $20). If the futures price increases to $380 by April and the basis is $20 over, the net purchase price remains at $370 per ton.

	Cash market	Futures market	Basis
Oct	expected cash Soybean Meal price is $370/ton	buy May Soybean Meal futures at $350/ton	+$20
Apr	buy cash Soybean Meal at $400/ton	sell May Soybean Meal futures at $380/ton	+$20
change	$30/ton loss	$30/ton gain	0
		buy cash Soybean Meal at	**$400/ton**
		gain on futures position –	**$30/ton**
		net purchase price	**$370/ton**

What if the basis strengthens – in this case, more positive – and instead of the expected $20 per ton over, it is actually $40 per ton over in April? Then the net purchase price increases by $20 to $390.

	Cash market	Futures market	Basis
Oct	expected cash Soybean Meal price is $370/ton	buy May Soybean Meal futures at $350/ton	+$20
Apr	buy cash Soybean Meal at $440/ton	sell May Soybean Meal futures at $400/ton	+$40
change	$70/ton loss	$50/ton gain	$20 loss
		buy cash Soybean Meal at	**$440/ton**
		gain on futures position	– **$50/ton**
		net purchase price	**$390/ton**

Conversely, if the basis weakens, moving from $20 over to $10 over, the net purchase price drops to $360 per ton ($350 + $10).

Notice how long hedgers benefit from a weakening basis – just the opposite of a short hedger. What is important to consider when hedging is basis history and market expectations. As a long hedger, if you like the current futures price and expect the basis to weaken, you should consider hedging a portion of your commodity purchase. On the other hand, if you expect the basis to strengthen and like today's prices, you might consider buying or pricing your commodity now.

	Cash market	Futures market	Basis
Oct	expected cash Soybean Meal price is $370/ton	buy May Soybean Meal futures at $350/ton	+$20
Apr	buy cash Soybean Meal at $390/ton	sell May Soybean Meal futures at $380/ton	+$10
change	$20/ton loss	$30/ton gain	$10 gain
		buy cash Soybean Meal at	**$390/ton**
		gain on futures position	– **$30/ton**
		net purchase price	**$360/ton**

Hedging with futures offers you the opportunity to establish an approximate price months in advance of the actual sale or purchase and protects the hedger from unfavorable price changes. This is possible because cash and futures prices tend to move in the same direction and by similar amounts, so losses in one market can be offset with gains in the other. Although the futures hedger is unable to benefit from favorable price changes, you are protected from unfavorable market moves.

Basis risk is considerably less than price risk, but basis behavior can have a significant impact on the performance of a hedge. A stronger-than-expected basis will benefit a short hedger, while a weaker-than-expected basis works to the advantage of a long hedger.

Cash market	Stronger	Weaker
Short Hedge	**Favorable**	**Unfavorable**
Long Hedge	**Unfavorable**	**Favorable**

Importance of Historical Basis

By hedging with futures, buyers and sellers are eliminating futures price level risk and assuming basis level risk. Although it is true that basis risk is relatively less than the risk associated with either cash market prices or futures market prices, it is still a market risk. Buyers and sellers of commodities can do something to manage their basis risk. Since agricultural basis tends to follow historical and seasonal patterns, it makes sense to keep good historical basis records.

The table below is a sample of a basis record. Although there are numerous formats available, the content should include: date, cash market price, futures market price (specify contract month), basis and market factors for that date. This information can be put into a chart format as well.

Basis Table Notes:

1) The most common type of basis record will track the current cash market price to the nearby futures contract month price. It is a good practice to switch the nearby contract month to the next futures contract month prior to entering the delivery month. For example, beginning with the second from last business day in November, switch tracking from Dec Corn futures to the Mar Corn futures (the next contract month in the Corn futures cycle).

2) It is common to track basis either daily or weekly. If you choose to keep track of basis on a weekly schedule, be consistent with the day of the week you follow. Also, you may want to avoid tracking prices and basis only on Mondays or Fridays.

3) Basis tables will help you compare the current basis with the expected basis at the time of your purchases or sales. In other words, it will help determine if a supplier's current offer or an elevator's current bid is stronger or weaker than expected at the time of the purchase or sale.

4) Putting basis information from multiple years on a chart will highlight the seasonal and historical patterns. It will also show the historical basis range (strongest and weakest levels) for any given time period, as well as the average.

Date	Cash price	Futures price/month	Basis	Market factors
10/02	$6.60	$6.77 Dec.	– $.17 (Z*)	Extended local dry spell in forecast
10/03	$6.70	$6.95 Dec.	– $.25 (Z)	Report of stronger than expected exports

*Z is the ticker symbol for December futures

QUIZ 2

1. **The premise that makes hedging possible is cash and futures prices:**
   (a) move in opposite directions
   (b) move upward and downward by identical amounts
   (c) generally change in the same direction by similar amounts
   (d) are regulated by the exchange

2. **To hedge against an increase in prices, you would:**
   (a) purchase futures contracts
   (b) sell futures contracts

3. **A farmer's crop is still in the field. His cash market position is:**
   (a) long
   (b) short
   (c) neither, since the crop hasn't been harvested
   (d) neutral, because he has no position in the futures market

4. **The term basis is:**
   (a) the difference between cash market prices in different locations
   (b) the difference between prices for different delivery months
   (c) the difference between the local cash price and a futures price
   (d) relevant only to speculation

5. **If you estimate the basis will be 15 over December futures at the time you purchase corn, the approximate buying price you can lock in by selling a December futures contract at $5.50 is:**
   (a) $5.65
   (b) $5.60
   (c) $5.35
   (d) none of the above

6. **If you estimate the local cash price will be 15 under the March futures price at the time you deliver your corn, the approximate net selling price you can lock in by selling a March futures contract at $5.50 is:**
   (a) $5.65
   (b) $5.60
   (c) $5.35
   (d) none of the above

7. **Assuming your local cash price is generally quoted under the CME Group futures price, an increase in transportation costs in your area would be expected to have what effect on the basis:**
   (a) weaken the basis
   (b) strengthen the basis
   (c) no effect on the basis

8. **If you have a long cash market position and do not hedge it, you are:**
   (a) a speculator
   (b) in a position to profit from an increase in price
   (c) subject to a loss if prices decline
   (d) all of the above

9. **Assume your supplier's cash market price is generally quoted over the CME Group's futures price. If you hedge by purchasing a futures contract, a good time to purchase the physical product and lift the hedge would be:**

   (a) once you have hedged, it makes no difference

   (b) when the basis is relatively weak

   (c) when the basis is relatively strong

   (d) whenever the cash market price is highest

10. **Basis risk involves:**

   (a) the fact that basis cannot be predicted exactly

   (b) the absolute level of futures prices

   (c) the inherent volatility of futures prices

11. **Suppose you're a snack food manufacturer wanting to establish a purchase price for soybean oil you will need by late February. Currently, Mar Soybean Oil futures are trading at 55 cents per pound and the local basis for February delivery is 5 cents over Mar Soybean Oil futures. From your basis records, the basis is typically 2 cents over Mar Soybean Oil futures for February delivery. Under this situation, it would make "sense" to:**

   (a) hedge yourself in the futures market to take advantage of today's prices and wait until the basis weakens to purchase soybean oil in the cash market

   (b) purchase the soybean oil in the cash market and not hedge yourself

   (c) do nothing

12. **Assume you're a flour miller and decide to hedge your upcoming wheat purchase. At the time, CME Group Dec Wheat futures are trading at $6.50 a bushel and the expected local basis for delivery mid-November is 12 cents over December futures. If you hedge your position, what is your expected purchase price if the basis is 12 cents over?**

   (a) $6.50

   (b) $6.62

   (c) $6.40

See the answer guide at the back of this book.

CHAPTER 3
FUTURES HEDGING STRATEGIES FOR BUYING AND SELLING COMMODITIES

Now that you have a basic understanding of how futures contracts are used to manage price risks and how basis affects your buying and selling decisions, it is time to try your hand at a few strategies. Upon completing this chapter, you should be able to:

- Recognize those situations when you will benefit most from hedging
- Calculate the dollars and cents outcome of a given strategy, depending on market conditions
- Understand the risks involved with your marketing decisions

The strategies covered in this chapter include:

- Buying futures for protection against rising commodity prices
- Selling futures for protection against falling commodity prices

To review some of the points from the preceding chapter, hedging is used to manage your price risks. If you are a buyer of commodities and want to hedge your position, you would initially buy futures contracts for protection against rising prices. At a date closer to the time you plan to actually purchase the physical commodity, you would offset your futures position by selling back the futures contracts you initially bought. This type of hedge is referred to as a long hedge. Long hedgers benefit from a weakening basis.

On the other hand, if you sell commodities and need protection against falling prices, you would initially sell futures contracts. At a date closer to the time you price the physical commodity, you would buy back the futures contracts you initially sold. This is referred to as a short hedge. Short hedgers benefit from a strengthening basis.

The following strategies are examples of how those in agribusiness use futures contracts to manage price risks. Also, note how basis information is used in making hedging decisions and how changes in the basis affect the final outcome.

Buying Futures for Protection Against Rising Prices

Assume you are a feed manufacturer and purchase corn on a regular basis. It is December and you are in the process of planning your corn purchases for the month of April – wanting to take delivery of the corn during mid-April. Several suppliers in the area are offering long-term purchase agreements, with the best quote among them of 5 cents over May futures. CME Group May futures are currently trading at $5.75 per bushel, equating to a cash forward offer of $5.80 per bushel.

If you take the long-term purchase agreement, you will lock in the futures price of $5.75 per bushel and a basis of 5 cents over, or a flat price of $5.80 per bushel. Or, you could establish a futures hedge, locking in a futures price of $5.75 per bushel but leaving the basis open.

In reviewing your records and historical prices, you discover the spot price of corn in your area during mid-April averages 5 cents under the May futures price. And, based on current market conditions and what you anticipate happening between now and April, you believe the mid-April basis will be close to 5 cents under.

Action

Since you like the current futures price but anticipate the basis weakening, you decide to hedge your purchase using futures rather than entering into a long-term purchase agreement. You purchase the number of corn contracts equal to the amount of corn you want to hedge. For example, if you want to hedge 15,000 bushels of corn, you buy (go "long") three Corn futures contracts because each contract equals 5,000 bushels.

By hedging with May Corn futures, you lock in a purchase price level of $5.75 but the basis level is not locked in at this time. If the basis weakens by April, you will benefit from any basis improvement. Of course, you realize the basis could surprise you and strengthen, but, based on your records and market expectations, you feel it is in your best interest to hedge your purchases.

Prices Increase Scenario

If the price increases and the basis at 5 cents over, you will purchase corn at $5.80 per bushel (futures price of $5.75 + the basis of $.05 over). But if the price increases and the basis weakens, the purchase price is reduced accordingly.

Assume by mid-April, when you need to purchase the physical corn, the May futures price has increased to $6.25 and the best offer for physical corn in your area is $6.20 per bushel (futures price – the basis of $.05 under).

	Cash market	Futures market	Basis
Dec	long-term offer at $5.80/bu	buy May Corn futures at $5.75/bu	+.05
Apr	buy cash Corn at $6.20/bu	sell May Corn futures at $6.25/bu	–.05
change	$.40/bu loss	$.50/bu gain	.10 gain
		buy cash Corn at	**$6.20/bu**
		gain on futures position	– **$.50/bu**
		net purchase price	**$5.70/bu**

With the futures price at $6.25, the May Corn futures contract is sold back for a net gain of 50 cents per bushel ($6.25 – $5.75). That amount is deducted from the current local cash price of corn, $6.20 per bushel, which equals a net purchase price of $5.70. Notice the price is 50 cents lower than the current cash price and 10 cents lower than what you would have paid for corn through a long-term purchase agreement. The lower price is a result of a weakening of the basis by 10 cents, moving from 5 cents over to 5 cents under May futures.

Prices Decrease Scenario

If prices decrease and the basis remains unchanged, you will still pay $5.80 per bushel for corn. Hedging with futures provides protection against rising prices, but it does not allow you to take advantage of lower prices. In making the decision to hedge, one is willing to give up the chance to take advantage of lower prices in return for price protection. On the other hand, the purchase price will be lower if the basis weakens.

Assume by mid-April the May futures price is $5.45 per bushel and the best quote offered by an area supplier is also $5.45 per bushel. You purchase corn from the supplier and simultaneously offset your futures position by selling back the futures contracts you initially bought.

Even though you were able to purchase cash corn at a lower price, you lost 30 cents on your futures position. This equates to a net purchase price for corn of $5.75. The purchase price is still 5 cents lower than what you would have paid for corn through a long-term purchase agreement. Again, this difference reflects a weakening of the basis from 5 cents over to even (no basis).

In hindsight, you would have been better off neither taking the long-term purchase agreement nor hedging because prices fell. But your job is to purchase corn, add value to it, and sell the final product at a profit. If you don't do anything to manage price risk, the result could be disastrous to your firm's bottom line. Back in December, you evaluated the price of corn, basis records and your firm's expected profits based upon that information. You determined by hedging and locking in the price for corn your firm could earn a profit. You also believed the basis would weaken, so you hedged to try and take advantage of a weakening basis. Therefore, you accomplished what you intended. The price of corn could have increased just as easily.

	Cash market	Futures market	Basis
Dec	long-term offer at $5.80/bu	buy May Corn futures at $5.75/bu	+.05
Apr	buy cash Corn at $5.45/bu	sell May Corn futures at $5.45/bu	.00
change	$.35/bu gain	$.30/bu loss	.05 gain
		buy cash Corn at	**$5.45/bu**
		loss on futures position	+ **$.30/bu**
		net purchase price	**$5.75/bu**

Prices Increase/Basis Strengthens Scenario

If the price rises and the basis strengthens, you will be protected from the price increase by hedging but the strengthening basis will increase the final net purchase price relative to the long-term purchase agreement.

Assume in mid-April your supplier is offering corn at $6.10 per bushel and the May futures contract is trading at $6.03 per bushel. You purchase the physical corn and offset your futures position by selling back your futures contracts at $6.03. This provides you with a futures gain of 28 cents per bushel, which lowers the net purchase price. However, the gain does not make up entirely for the higher price of corn. The 2-cent difference between the long-term purchase agreement and the net purchase price reflects the strengthening basis.

	Cash market	Futures market	Basis
Dec	long-term offer at $5.80/bu	buy May Corn futures at $5.75/bu	+.05
Apr	buy cash Corn at $6.10/bu	sell May Corn futures at $6.03/bu	+.07
change	$.30/bu loss	$.28/bu gain	.02 loss
		buy cash Corn at	**$6.10/bu**
		gain on futures position	**– $.28/bu**
		net purchase price	**$5.82/bu**

As we've seen in the preceding examples, the final outcome of a futures hedge depends on what happens to basis between the time a hedge is initiated and offset. In those scenarios, you benefited from a weakening basis.

In regard to other marketing alternatives, you may be asking yourself how does futures hedging compare? Suppose you had entered a long-term purchase agreement instead of hedging? Or maybe you did nothing at all – what happens then?

The table below compares your alternatives illustrating the potential net purchase price under several possible futures prices and basis scenarios. You initially bought May Corn futures at $5.75.

You can not predict the future but you can manage it. By evaluating your market expectations for the months ahead and reviewing past records, you will be in a better position to take action and not let a buying opportunity pass you by.

Alternative 1 shows what your purchase price would be if you did nothing at all. While you would benefit from a price decrease, you are at risk if prices increase and you are unable to manage your bottom line.

If May futures price in April is:	April basis	**Alternative 1** Do nothing (spot cash price)	**Alternative 2** Hedge with futures at $5.75	**Alternative 3** Long-term purchase agreement at $5.80
$5.65	+.05	$5.70	$5.80	$5.80
$5.75	+.05	$5.80	$5.80	$5.80
$5.85	+.05	$5.90	$5.80	$5.80
$5.65	–.05	$5.50	$5.70	$5.80
$5.75	–.05	$5.70	$5.70	$5.80
$5.85	–.05	$5.80	$5.70	$5.80
$5.65	+.10	$5.75	$5.85	$5.80
$5.75	+.10	$5.85	$5.85	$5.80
$5.85	+.10	$5.95	$5.85	$5.80

Alternative 2 shows what your purchase price would be if you established a long hedge in December, offsetting the futures position when you purchase physical corn in April. As you can see, a changing basis affects the net purchase price but not as much as a significant price change.

Alternative 3 shows what your purchase price would be if you entered a long-term purchase agreement in December. Basically, nothing affected your final purchase price but you could not take advantage of a weakening basis or lower prices.

QUIZ 3

1. **Suppose, as in the previous scenario, you purchase a May Corn futures contract at $5.75 per bushel and the basis is 5 cents under when you actually buy corn from your supplier in April. What would be the net purchase price in April if the May Corn futures price is:**

May futures price	Net purchase price
$5.58	$_____per bu
$5.84	$_____per bu
$5.92	$_____per bu

2. **What would your net purchase price be if May Corn futures is $5.80 and the basis is 7 cents over when you offset your futures position in April?**

See the answer guide at the back of this book.

Selling Futures for Protection Against Falling Prices

Assume you are a corn producer. It is May 15 and you just finished planting your crop. The weather has been unseasonably dry, driving prices up significantly. However, you feel the weather pattern is temporary and are concerned corn prices will decline before harvest.

Currently, Dec Corn futures are trading at $5.70 per bushel and the best bid on a forward contract is $5.45 per bushel, or 25 cents under the December futures contract. Your estimated cost of production is $5.10 per bushel. Therefore, you could lock in a profit of 35 cents per bushel through this forward contract. Before entering into the contract, you review historical prices and basis records and discover the local basis during mid-November is usually about 15 cents under December futures.

Action

Because the basis in the forward contract is historically weak, you decide to hedge using futures. You sell the number of corn contracts equal to the amount of corn you want to hedge. For example, if you want to hedge 20,000 bushels of corn, you sell (go "short") four Corn futures contracts because each futures contract equals 5,000 bushels. By selling Dec Corn futures, you lock in a selling price of $5.45 if the basis remains unchanged (futures price of $5.70 – the basis of $.25). If the basis strengthens, you will benefit from any basis appreciation. But remember, there is a chance the basis could actually weaken. So, although you maintain the basis risk, basis is generally much more stable and predictable than either the cash market or futures market prices.

Prices Decrease Scenario

If the price declines and the basis remains unchanged, you are protected from the price decline and will receive $5.45 per bushel for your crop (futures price of $5.70 – the basis of $.25). If the price drops and the basis strengthens, you will receive a higher than expected price for your corn. By November, the best spot bid in your area for corn is $5.05 per bushel. Fortunately, you were hedged in the futures market and the current December futures price is $5.20. When you offset the futures position by buying back the same type and amount of futures contracts as you initially sold, you realize a gain of 50 cents per bushel ($5.70 – $5.20). Your gain in the futures market increases your net sales price. As you can see from the following table, the net sales price is actually 10 cents greater than the forward contract bid quoted in May. This price difference reflects the change in basis, which strengthened by 10 cents between May and November.

	Cash market	Futures market	Basis
May	cash forward (Nov) bid at $5.45/bu	sell Dec Corn futures at $5.70/bu	–.25
Nov	sell cash Corn at $5.05/bu	buy Dec Corn futures at $5.20/bu	–.15
change	$.40/bu loss	$.50/bu gain	.10 gain
		sell cash Corn at	**$5.05/bu**
		gain on futures position	+ **$.50/bu**
		net selling price	**$5.55/bu**

	Cash market	Futures market	Basis
May	cash forward (Nov) bid at $5.45/bu	sell Dec Corn futures at $5.70/bu	–.25
Nov	sell cash Corn at $5.70/bu	buy Dec Corn futures at $5.90/bu	–.20
change	$.25/bu gain	$.20/bu loss	.10 gain
		sell cash Corn at	**$5.70/bu**
		loss on futures position	– **$.20/bu**
		net selling price	**$5.50/bu**

Prices Increase Scenario

If the price increases and the basis remains unchanged, you will still receive $5.45 per bushel for your crop. That is the futures price ($5.70) less the basis (25 cents under). With futures hedging, you lock in a selling price and cannot take advantage of a price increase. The only variable that ultimately affects your selling price is basis. As shown in the following example, you will receive a higher than expected price for your corn if the basis strengthens.

Suppose by mid-November the futures price increased to $5.90 per bushel and the local price for corn is $5.70 per bushel. Under this scenario, you will receive $5.50 per bushel – 5 cents more than the May forward contract bid. In reviewing the table below, you will see the relatively higher price reflects a strengthening basis and is not the result of a price level increase. Once you establish a hedge, the futures price level is locked in. The only variable is basis.

If you could have predicted the future in May, more than likely you would have waited and sold your corn in November for $5.70 per bushel rather than hedging. But predicting the future is beyond your control. In May, you liked the price level and knew the basis was historically weak. Knowing your production cost was $5.10 per bushel, a selling price of $5.45 provided you a respectable profit margin.

In both of these examples, the basis strengthened between the time the hedge was initiated and offset, which worked to your advantage. But how would your net selling price be affected if the basis weakened?

Prices Decrease/Basis Weakens Scenario

If the price falls and the basis weakens, you will be protected from the price decrease by hedging but the weakening basis will slightly decrease the final net sales price.

Assume by mid-November, the December futures price is $5.37 and the local basis is 27 cents under. After offsetting your futures position and simultaneously selling your corn, the net sales price equals $5.43 per bushel. You will notice the net sales price is 2 cents lower than the forward contract bid in May, reflecting the weaker basis.

	Cash market	Futures market	Basis
May	cash forward (Nov) bid at $5.45/bu	sell Dec Corn futures at $5.70/bu	–.25
Nov	sell cash Corn at $5.10/bu	buy Dec Corn futures at $5.37/bu	–.27
change	$.35/bu loss	$.33/bu gain	.02 gain
		sell cash Corn at	**$5.10/bu**
		gain on futures position	+ **$.33/bu**
		net selling price	**$5.43/bu**

As we've seen in the preceding examples, the final outcome of a futures hedge depends on what happens to the basis between the time a hedge is initiated and offset. In these scenarios, you benefited from a strengthening basis and received a lower selling price from a weakening basis.

In regard to other marketing alternatives, you may be asking yourself how does futures hedging compare? Suppose you had entered a forward contract instead of hedging? Or maybe you did nothing – what happens then?

The following table compares your alternatives and illustrates the potential net return under several different price levels and changes to the basis.

You can calculate your net sales price under different futures prices and changes to the basis. Of course, hindsight is always 20/20 but historical records will help you take action and not let a selling opportunity pass you up.

Alternative 1 shows what your net sales price would be if you did nothing at all. While you would benefit from a price increase, you are at risk if the price of corn decreases and at the mercy of the market.

Alternative 2 shows what your net return would be if you established a short hedge at $5.70 in May, offsetting the futures position when you sell your corn in November. As you can see, a changing basis is the only thing that affects the net sales price.

Alternative 3 shows what your net return would be if you cash forward contracted in May. Basically, nothing affected your final sales price, but you could not take advantage of a strengthening basis or higher prices.

If Dec futures price in Nov. is:	Mid-Nov. basis	**Alternative 1** Do nothing (spot cash price)	**Alternative 2** Hedge with futures at $5.70	**Alternative 3** Cash forward contract at $5.45
$5.60	–.25	$5.35	$5.45	$5.45
$5.70	–.25	$5.45	$5.45	$5.45
$5.80	–.25	$5.55	$5.45	$5.45
$5.60	–.15	$5.45	$5.55	$5.45
$5.70	–.15	$5.55	$5.55	$5.45
$5.80	–.15	$5.65	$5.55	$5.45
$5.60	–.35	$5.25	$5.35	$5.45
$5.70	–.35	$5.35	$5.35	$5.45
$5.80	–.35	$5.45	$5.35	$5.45

QUIZ 4

1. **Let's assume you're a soybean producer. In July, you decide to hedge the sale of a portion of your expected bean crop for delivery in the fall. Currently, November futures are trading at $12.55 per bushel, and the quoted basis for harvest delivery today is 25 cents under Nov Soybean futures. According to your historical basis records, the local basis for harvest is normally 20 cents under the Nov Soybean futures contract. Fill out the blanks below:**

Cash forward market Jul	Futures market	Basis
_____	_____	_____

What price will you receive for your harvest sale if the actual basis is as you expected?

Sold Nov futures in July at:	Expected basis	Expected selling price
_____	_____	_____

2. **By October, the local elevator price for soybeans has declined to $11.90 per bushel. You sell your soybeans for that cash price, and you buy a futures contract at $12.10 per bushel to off set your hedge. Bring down the information from the previous table and complete the remainder of the table below.**

Cash forward market	Futures market	Basis
Jul		
_____	_____	_____
Oct		
_____	_____	_____

Result: _____ gain/loss _____ change

cash sale price	_____
gain/loss on futures position	_____
net sales price	_____

See the answer guide at the back of this book.

CHAPTER 4 THE BASICS OF AG OPTIONS

Hedging with futures is a valuable risk management tool if used at the right time. Hedging allows you to lock in a certain price level and protects you against adverse price moves. In other words, you are committed to a specific buying or selling price and are willing to give up any additional market benefit if prices move in your favor because you want price protection.

Remember, hedging involves holding opposite positions in the cash and futures markets. So, as the value of one position rises, the value of the other position falls. If the value of the hedger's cash market position increases, the value of the hedger's futures market position decreases and the hedger may receive a performance bond/margin call.

When buying an option, a hedger is protected against an unfavorable price change but, at the same time, can take advantage of a favorable price change. In addition, buying an option does not require performance bond/margin, so there isn't any risk of receiving a performance bond/margin call.

These features allow sellers of ag commodities to establish floor (minimum) selling prices for protection against falling markets without giving up the opportunity to profit from rising markets. Likewise, options allow buyers of ag products to set ceiling (maximum) buying prices and protect themselves from price increases. At the same time, they retain the ability to take advantage of price decreases. The cost of these benefits is the option premium. The option buyer pays the premium.

Rather than buying an option to protect yourself from an unfavorable price change, sometimes you may find it attractive to sell an option. Although selling an option provides only limited protection against unfavorable market moves and requires you to post performance bond/margin, it provides additional income if prices remain stable or move in a favorable direction. The option seller collects the premium.

What Is an Option?

An option is simply the right, but not the obligation, to buy or sell something at a specific predetermined price (strike price) at any time within a specified time period. A commodity option, also known as an option on a futures contract, contains the right to buy or sell a specific futures contract.

There are two distinct types of options: call options and put options. Call options contain the right to buy the underlying futures contract and put options contain the right to sell the underlying futures contract. Note: Call and put options are not the opposite of each other, nor are they offsetting positions.

Call and put options are completely separate and different contracts. Every call option has a buyer and seller and every put option has a buyer and seller. Buyers of calls or puts are buying (holding) the rights contained in the specific option. Sellers of calls or put options are selling (granting) the rights contained in the specific option.

Option buyers pay a price for the rights contained in the option. The option price is known as premium*. An option buyer has limited loss potential (premium paid) and unlimited gain potential. The premium is paid initially when the option is bought. Since the option buyer has rights, but not obligations, the option buyer does not have performance bond/margin requirements. Option buyers can exercise (use) their rights at any time prior to the option expiration.

Option sellers collect the premium for their obligations to fulfill the rights. An option seller has limited gain potential (premium received) and unlimited loss potential, due to the obligations of the position. Since the option seller has obligations to the marketplace, option sellers have performance bond/margin requirements to ensure contract performance.

* More details on premium will be covered later in this chapter.

Option sellers are obligated to fulfill the rights contained in an option if and when the option buyer chooses to exercise the rights. Since there can be many option buyers and sellers of identical options, there is a random selection of the option sellers to determine which option seller will be exercised on.

Although option sellers cannot initiate the exercise process, they can offset their short option position by buying an identical option at any time prior to the close of the last trading day.

Exercise Position Table

	Call option	Put option
Option buyer	Pays premium; right to buy	Pays premium; right to sell
Option seller	Collects premium; obligation to sell	Collects premium; obligation to buy

Underlying Commodity

Traditional commodity options are called standard options. Standard options have the same contract month name as the underlying futures contract. Exercising a standard option will result in a futures position in the same contract month as the option at the specified strike price.

Exercising a $12.00 Nov Soybean call option will result in the: call option buyer receiving a long (buy) position in Nov Soybean futures at $12.00; the call option seller receiving a short (sell) position in Nov Soybean futures at $12.00.

Exercising a $6.50 Jun Corn put option will result in the put option buyer receiving a short (sell) position in Jul Corn futures at $6.50; the put option seller being assigned to a long (buy) position in Jul Corn futures at $6.50.

When Do Option Rights Expire?

The last trading day and the expiration of standard and serial options occur in the month prior to their contract month name (e.g., Mar Oat options expire in February and Oct Wheat serial options expire in September). The last trading day and expiration of a weekly option is a given Friday that is not also the last trading day in a standard or serial option.

The last trading day is the last day that an option can be bought or sold. The last trading day of an option is the Friday preceding the first position day of the contract month. Therefore, a general rule of thumb is the option's last trading day will usually be the third or fourth Friday in the month prior to the option contract month. Option expiration occurs at 7:00 p.m. on the last trading day.

How Are Options Traded?

CME Group option contracts are traded in much the same manner as their underlying futures contracts. All buying and selling occurs through competitive bids and offers made via the CME Globex electronic trading platform. There are several important facts to remember when trading options:

- At any given time, there is simultaneous trading in a number of different call and put options – different in terms of commodities, contract months and strike prices.
- Strike prices are listed in predetermined intervals (multiples) for each commodity. Since strike price intervals may change in response to market conditions, CME Group/CBOT Rules and Regulations should be checked for current contract information.
- When an option is first listed, strike prices include an at- or near-the-money option, and strikes above and strikes below the at-the-money strike. This applies to both puts and calls. As market conditions change additional strike prices are listed, offering you a variety of strikes to choose from.

CORN, WHEAT, (CHICAGO SRW/KC HRW) OATS

Standard months	Serial months
March	January
May	February
July	April
September	June
December	August
	October
	November

RICE

Standard months	Serial months
January	February
March	April
May	June
July	August
September	October
November	December

SOYBEANS

Standard months	Serial months
January	February
March	April
May	June
July	October
August	December
September	
November	

SOYBEAN OIL AND MEAL

Standard months	Serial months
January	February
March	April
May	June
July	November
August	
September	
October	
December	

- An important difference between futures and options is trading in futures contracts is based on prices, while trading in options is based on premiums. To illustrate, someone wanting to buy a Dec Corn futures contract might bid $6.50 per bushel. But a person wanting to buy an option on Dec Corn futures might bid 25 cents for a $6.60 call option or 40 cents for a $6.40 call option. These bids – 25 cents and 40 cents – are the premiums that a call option buyer pays a call option seller for the right to buy a Dec Corn futures contract at $6.60 and $6.40, respectively.
- The premium is the only element of the option contract negotiated through the trading process; all other contract terms are standardized.
- For an option buyer, the premium represents the maximum cost or amount that can be lost, since the option buyer is limited only to the initial investment. In contrast, the premium represents the maximum gain for an option seller.

Option Pricing

At this point in your study of options, you may be asking yourself some very important questions: How are option premiums arrived at on a day-to-day basis? Will you have to pay 10 cents for a particular option? Or will it cost 30 cents? And if you bought an option and want to sell it prior to expiration, how much will you be able to get for it?

The short answer to these questions is that premium is determined by basic supply and demand fundamentals. In an open-auction market, buyers want to pay the lowest possible price for an option and sellers want to earn the highest possible premium. There are some basic variables that ultimately affect the price of an option as they relate to supply and demand, and they will be covered in the next section.

Intrinsic Value

It can be said that option premiums consist of two components:

1. Intrinsic value

2. Time value

An option's premium at any given time is the total of its intrinsic value and its time value. The total premium is the only number you will see or hear quoted. However, it is important to understand the factors that affect time value and intrinsic value, as well as their relative impact on the total premium.

Intrinsic value + Time value = **Premium**

Intrinsic Value – This is the amount of money that could be currently realized by exercising an option with a given strike price. An option's intrinsic value is determined by the relationship of the option strike price to the underlying futures price. An option has intrinsic value if it is currently profitable to exercise the option.

A call option has intrinsic value if its strike price is below the futures price. For example, if a Soybean call option has a strike price of $12.00 and the underlying futures price is $12.50, the call option will have an intrinsic value of 50 cents. A put option has intrinsic value if its strike price is above the futures price. For example, if a Corn put option has a strike price of $5.60 and the underlying futures price is $5.30, the put option will have an intrinsic value of 30 cents.

Determining Intrinsic Value

Calls: Strike price < Underlying futures price

Puts: Strike price > Underlying futures price

Option Classification

At any point in the life of an option, puts and calls are classified based on their intrinsic value. The same option can be classified differently throughout the life of the option.

In-the-Money – In trading jargon, an option, whether a call or a put, that has intrinsic value (i.e., currently worthwhile to exercise) is said to be in-the-money by the amount of its intrinsic value. At expiration, the value of a given option will be whatever amount, if any, that the option is in-the-money. A call option is in-the-money when the strike price is below the underlying futures price. A put option is in-the-money when the strike price is greater than the underlying futures price.

Out-of-the-Money – A call option is said to be out-of-the-money if the option strike price is currently above the underlying futures price. A put option is out-of-the-money if the strike price is below the underlying futures price. Out-of-the-money options have no intrinsic value.

At-the-Money – If a call or put option strike price and the underlying futures price are the same, or approximately the same, the option is at-the-money. At-the-money options have no intrinsic value.

Determining Option Classifications

IN-THE-MONEY

Call option: Futures price > Strike price

Put option: Futures price < Strike price

OUT-OF-THE-MONEY

Call option: Futures price < Strike price

Put option: Futures price > Strike price

AT-THE-MONEY

Call option: Futures price = Strike price

Put option: Futures price = Strike price

To repeat, an option's value at expiration will be equal to its intrinsic value – the amount by which it is in-the-money. This is true for both puts and calls.

Calculating an Option's Intrinsic Value

Mathematically speaking, it is relatively easy to calculate an option's intrinsic value at any point in the life of an option. The math function is basic subtraction. The two factors involved in the calculation are the option's strike price and the current underlying futures price.

For call options, intrinsic value is calculated by subtracting the call strike price from the underlying futures price.

- If the difference is a positive number (i.e., the call strike price is less than the underlying futures price), there is intrinsic value.
  - Example: 52 Dec Soybean Oil call when Dec Soybean Oil futures is trading at 53 cents ($.53 – $.52 strike price = $.01 of intrinsic value).
- If the difference is 0 (i.e., call strike price is equal to the underlying futures price), then that call option has no intrinsic value.
  - Example: 52 Dec Soybean Oil call when Dec Soybean Oil futures is trading at 52 cents ($.52 – $.52 strike price = 0 intrinsic value).
- If the difference is a negative number (i.e., call strike price is greater than the underlying futures price), then the call option currently has no intrinsic value.
  - Example: 52 Dec Soybean Oil call when Dec Soybean Oil futures is trading at 50 cents ($.50 – $.52 strike price = 0 intrinsic value).

Note: Intrinsic value can only be a positive number (i.e., an option can't have negative intrinsic value). Therefore, you can say the call option in this example is out-of-the-money by 2 cents, but you shouldn't say that it has a negative 2 cents intrinsic value.

For put options, intrinsic value is calculated by subtracting the underlying futures price from the put strike price.

- If the difference is a positive number (i.e., the put strike price is greater than the underlying futures price), there is intrinsic value.
  - Example: $6.50 Mar Wheat put when Mar Wheat futures is trading at $6.20 ($6.50 strike price – $6.20) = $.30 of intrinsic value).
- If the difference is 0 (i.e., put strike price is equal to the underlying futures price), then that put option has no intrinsic value.
  - Example: $6.50 Mar Wheat put when Mar Wheat futures is trading at $6.50 ($6.50 strike price – $6.50 = 0 intrinsic value).
- If the difference is a negative number (i.e., put strike price is less than the underlying futures price), then the put option currently has no intrinsic value.
  - Example: $6.50 Mar Wheat put when Mar Wheat futures is trading at $6.75. ($6.50 strike price – $6.75 = 0 intrinsic value) Note: Intrinsic value can only be a positive number (i.e., an option can't have negative intrinsic value). Therefore, you can say the put option in this example is out-of-the-money by 25 cents but you shouldn't say that it has a negative 25 cents intrinsic value.

At the expiration of a call or put option, the option's premium consists entirely of intrinsic value – the amount that it is in-the-money.

Time Value

If an option doesn't have intrinsic value (either it's at-the-money or out-of-the-money), that option's premium would be all time value. Time value is the difference between the total premium and the intrinsic value.

Total premium
– Intrinsic value
Time value

Although the mathematics of calculating time value is relatively easy when you know the total premium and the intrinsic value, it is not quite as easy to understand the factors that affect time value.

Time value, sometimes called extrinsic value, reflects the amount of money buyers are willing to pay in expectation that an option will be worth exercising at or before expiration.

QUIZ 5

Here's a quick quiz to check your understanding of what the intrinsic value will be for a given option. If you have fewer than six correct answers, it would be a good idea to review the preceding discussion.

1. **A Nov Soybean call has a strike price of $11.50. The underlying November futures price is $12.00.**
   The intrinsic value is _____.
2. **A Jul Corn call has a strike price of $5.50. The underlying July futures price is $5.50.**
   The intrinsic value is _____.
3. **A Sep Wheat call has a strike price of $6.00. The underlying September futures price is $6.50.**
   The intrinsic value is _____.
4. **A Mar Soybean call has a strike price of $13.50. The underlying March futures price is $12.89.**
   The intrinsic value is _____.
5. **An Aug Soybean meal put has a strike price of $320. The underlying August futures price is $340.**
   The intrinsic value is _____.
6. **A Dec Wheat put has a strike price of $6.60. The underlying December futures price is $6.20.**
   The intrinsic value is _____.
7. **A May Corn put has a strike price of $5.80. The underlying May futures price is $5.55.**
   The intrinsic value is _____.
8. **A Sep Soybean put has a strike price of $12.20. The underlying September futures price is $12.77.**
   The intrinsic value is _____.

See the answer guide at the back of this book.

One of the factors that affects time value reflects the amount of time remaining until the option expires. For example, let's say that on a particular day in mid-May the Nov Soybean futures price is quoted at $12.30. Calls with a strike price of $12.50 on Nov Soybean futures are trading at a price of 12 cents per bushel. The option is out of the money and therefore, has no intrinsic value. Even so, the call option has a premium of 12 cents (i.e., the option's time value or its extrinsic value) and a buyer may be willing to pay 12 cents for the option.

Why? Because the option still has five months to go before it expires in October, and, during that time, you hope that the underlying futures price will rise above the $12.50 strike price. If it were to climb above $12.62 (strike price of $12.50 + $.12 premium), the holder of the option would realize a profit.

At this point in the discussion, it should be apparent why at expiration an option's premium will consist only of intrinsic value. Such an option would no longer have time value – for the simple reason that there is no longer time remaining.

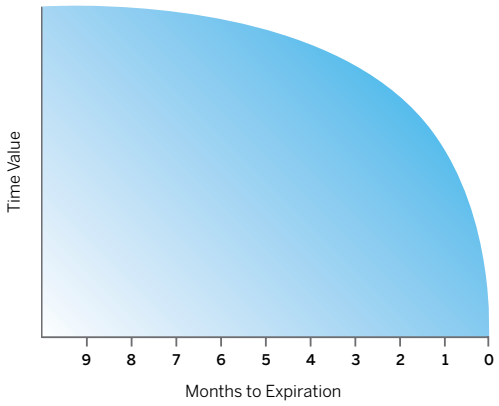
Let's go back to the out-of-the-money call, which, five months prior to expiration, commanded a premium of 12 cents per bushel. The next question is why 12 cents? Why not 10 cents? Or 30 cents? In other words, what are the factors that influence an option's time value? While interest rates and the relationship between the underlying futures price and the option strike price affect time value, the two primary factors affecting time value are:

1. The length of time remaining until expiration.
2. The volatility of the underlying futures price.

Length of Time Remaining Until Expiration

All else remaining equal, the more time an option has until expiration, the higher its premium. Time value is usually expressed in the number of days until expiration. This is because it has more time to increase in value (to employ an analogy, it's safer to say it will rain within the next five days than to say it will rain within the next two days). Again, assuming all else remains the same, an option's time value will decline (erode) as the option approaches expiration. This is why options are sometimes described as "decaying assets." As the previous chart shows, an option at expiration will have zero time value (its only value, if any, will be its intrinsic value).

Also note that the rate of decay increases as you approach expiration. In other words, as the option approaches expiration, the option buyer loses a larger amount of time value each day.



Therefore, hedgers, who buy options, may want to consider offsetting their long option position prior to the heavy time value decay and replace it with another risk management position in the cash, futures or option market.

Volatility of the Underlying Futures Price

All else remaining the same, option premiums are generally higher during periods when the underlying futures prices are volatile. There is more price risk involved with market volatility and therefore a greater need for price protection. The cost of the price insurance associated with options is greater, and thus the premiums will be higher. Given that an option may increase in value when futures prices are more volatile, buyers will be willing to pay more for the option. And, because an option is more likely to become worthwhile to exercise when prices are volatile, sellers require higher premiums.

Thus, an option with 90 days to expiration might command a higher premium in a volatile market than an option with 120 days to expiration in a stable market.

Other Factors Affecting Time Value

Option premiums also are influenced by the relationship between the underlying futures price and the option strike price. All else being equal (such as volatility and length of time to expiration), an at-the-money option will have more time value than an out-of-the-money option. For example, assume a Soybean Oil futures price is 54 cents per pound. A call with a 54-cent strike price (an at-the-money call) will command a higher premium than an otherwise identical call with a 56-cent strike price. Buyers, for instance, might be willing to pay 2 cents for the at-the-money call, but only 1.5 cents for the out-of-the-money call. The reason is that the at-the-money call stands a much better chance of eventually moving in-the-money.

An at-the-money option is also likely to have more time value than an option that is substantially in-the-money (referred to as a deep in-the-money option). One of the attractions of trading options is "leverage" – the ability to control relatively large resources with a relatively small investment. An option will not trade for less than its intrinsic value, so when an option is in-the-money, buyers generally will have to pay over and above its intrinsic value for the option rights. A deep in-the-money option requires a greater investment and compromises the leverage associated with the option. Therefore, the time value of the option erodes as the option becomes deeper in-the-money.

Generally, for a given time to expiration, the greater an option's intrinsic value, the less time value it is likely to have. At some point, a deep in-the-money option may have no time value – even though there is still time remaining until expiration.

Another factor influencing time value is interest rates. Although the effect is minimal, it is important to realize that as interest rates increase, time value decreases. The opposite is also true – as interest rates decrease, time value increases.

Option Pricing Summary

In the final analysis, the three most important things you need to know about option premium determination are:

1. Premiums are determined by supply and demand, through competition between option buyers and sellers.

2. At expiration, an option will have only intrinsic value (the amount that can be realized by exercising the option). If an option has no intrinsic value at expiration, it will expire worthless. At expiration, an option has zero time value.

3. Prior to expiration, an option's premium will consist of its intrinsic value (if any) plus its time value (if any). If an option has no intrinsic value, its premium prior to expiration will be entirely time value.

QUIZ 6

Here's a quick quiz to check your understanding of time value. If you have fewer than six correct, it would be a good idea to review the previous discussion on time value.

1. **A $5.70 Dec Corn call is selling for a premium of 35 cents. At the time, Dec Corn futures are trading at $6.00.**

   The time value is_____.

2. **A $12.80 Nov Soybean put is selling for a premium of 3 cents. Nov Soybean futures are trading at $12.77.**

   The time value is_____.

3. **A Wheat call has a strike price of $6.70. At expiration, the underlying futures price is $6.80.**

   The time value is_____.

4. **Jul Corn futures are trading at $6.00. A $5.50 July corn call is trading at a premium of 60 cents.**

   The time value is_____.

5. **Sep Soybean futures are trading at $12.20. A $12.50 Sep Soybean put is trading at a premium of 38 cents.**

   The time value is_____.

6. **The time value of an option is typically greatest when an option is _____-the-money.**

7. **All else being equal, an option with 60 days remaining until expiration has more or less time value than an option with 30 days remaining until expiration?_____.**

8. **If market volatility increases, the time value portion of the option generally_____.**

See the answer guide at the back of this book.

Option Pricing Models

As you become more familiar with option trading, you will discover there are computerized option pricing models that take into consideration the pricing factors we have discussed here and calculate "theoretical" option premiums. These theoretical option values may or may not match what an option actually trades for. So, regardless of what a computer pricing model may say, the final price of an option is discovered through the exchange's trading platforms.

These computer programs also determine how much risk a particular option position carries. This information is used by professional option traders to limit their risk exposure. Some of the different option variables used to measure risk are delta, gamma, theta and vega.

Delta – The option variable you may hear discussed most often is delta and is used to measure the risk associated with a futures position. Delta measures how much an option premium changes given a unit change in the underlying futures price.

Gamma – This variable measures how fast an option's delta changes as the underlying futures price changes. Gamma can be used as a gauge to measure the risk associated with an option position much the same way as delta is used to indicate the risk associated with a futures position.

Theta – The option pricing variable, theta, measures the rate at which an option's time value decreases over time. Professional option traders use theta when selling options to gauge profit potential or when buying options to measure their exposure to time decay.

Vega – The option variable that measures market volatility, or the riskiness of the market.

As a novice to options trading, it is good to be aware of these terms, but more than likely you won't use them. Typically, these pricing variables are used by professional option traders and commercial firms.

What Can Happen to an Option Position

Earlier in the chapter, we went over several examples in which the intrinsic value of the option was determined based on whether or not an option was exercised. Hopefully, this gave you a better understanding of how to determine the intrinsic value of an option. But, in reality, there are three different ways of exiting an option position:

- **Offset**
- **Exercise**
- **Expiration**

The most common method of exit is by offset.

Offsetting Options

Options that have value are usually offset before expiration. This is accomplished by purchasing a put or call identical to the put or call you originally sold or by selling a put or call identical to the one you originally bought.

For example, assume you need protection against rising wheat prices. At the time, Jul Wheat futures are trading at $6.75 a bushel and the $6.70 Jul Wheat call is trading for 12 cents a bushel ($.05 intrinsic value + $.07 time value). You purchase the Jul Wheat call. Later, July wheat moves to $7.00 and the $6.70 Jul Wheat call option is trading for a premium of 33 cents a bushel ($.30 intrinsic value + $.03 time value). You exit the option position by selling back the $6.70 call for its current premium of 33 cents.

The difference between the option purchase price and sale price is 21 cents a bushel ($.33 premium received when sold – $.12 premium paid when bought), which can be used to reduce the cost of wheat you are planning to buy.

Offsetting an option before expiration is the only way you'll recover any remaining time value. Offsetting also prevents the risk of being assigned a futures position (exercised against) if you originally sold an option.

Your net profit or loss, after a commission is deducted, is the difference between the premium paid to buy (or received to sell) the option and the premium you receive (or pay) when you offset the option. Market participants face the risk there may not be an active market at the time they choose to offset, especially if the option is deep out-of-the-money or the expiration date is near.

Exercising Options

Only the option buyer can exercise an option and can do so at any time during the life of the option, regardless of whether it is a put or a call. When an option position is exercised, both the buyer and the seller of the option are assigned a futures position. Here is how it works. The option buyer first notifies their broker that they want to exercise an option. The broker then submits an exercise notice to the clearing house. An exercise notice must be submitted to the clearing house by 6:00 p.m. CT on any business day so that the exercise process can be carried out that night.

Once the clearing house receives an exercise notice, it creates a new futures position at the strike price for the option buyer. At the same time, it assigns an opposite futures position at the strike price to a randomly selected clearing member who sold the same option. See the chart below. The entire procedure is completed before trading opens the following business day.

Futures Positions After Option Exercise

	Call option	Put option
Buyer assumes	Long futures position	Short futures position
Seller assumes	Short futures position	Long futures position

The option buyer would exercise only if an option is in-the-money. Otherwise, the option buyer would experience a market loss. For example, suppose you are holding a $6.50 Corn put option and the Corn futures market reaches $7.00. By exercising your $6.50 Corn put option you would be assigned a short futures position at $6.50. To offset the position you would end up buying Corn futures at $7.00, thus experiencing a 50-cent loss ($6.50 – $7.00 = –$.50).

Because option buyers exercise options when an option is in-the-money, the opposite futures position acquired by the option seller upon exercise will have a built-in loss. But this does not necessarily mean the option seller will incur a net loss. The premium the seller received for writing the option may be greater than the loss in the futures position acquired through exercise. For example, assume an option seller receives a premium of 25 cents a bushel for writing a Soybean call option with a strike price of $11.50. When the underlying futures price climbs to $11.65, the call is exercised. The call seller will thus acquire a short futures position at the strike price of $11.50. Since the current futures price is $11.65, there will be a 15-cent per bushel loss in the futures position. But, because that's less than the 25 cents received for writing the option, the option seller still has a 10-cent per bushel net profit. This profit can be locked in by liquidating the short futures position through the purchase of an offsetting futures contract.

On the other hand, suppose the futures price at the time the option was exercised had been $11.85 per bushel. In this case, the 35-cent loss on the short futures position acquired through exercise would exceed the 25-cent premium received for writing the call. The option seller would have a 10-cent per bushel net loss. And, had the futures price been higher, the net loss would have been greater.

The only alternative an option seller has to avoid exercise is to offset their short option position by buying an identical option prior to being assigned an exercise notice by the clearing house. Once the notice of exercise has been assigned, the alternative of purchasing an offsetting option is no longer available. The only alternative at this point will be to liquidate the futures position acquired through exercise by offsetting the assigned futures contract.

If, for some reason, you are holding an in-the-money option at expiration, the clearing house will automatically exercise the option unless you give notice to the clearing house before expiration.

Letting an Option Expire

The only other choice you have to exit an option position is to let the option expire – simply do nothing, anticipating the option will have no value at expiration (expire worthless). In fact, the right to hold the option up until the final day for exercising is one of the features that makes options attractive to many. So, if the change in price you've anticipated doesn't occur, or if the price initially moves in the opposite direction, you have the assurance that the most an option buyer can lose is the premium paid for the option. On the other hand, option sellers have the advantage of keeping the entire premium they earned provided the option doesn't move in-the-money by expiration.

Note: As an option trader, especially as an option buyer, you should not lose track of your option value, even if it is out-of-the-money (without intrinsic value) because you still may be able to recover any remaining time value through offset.

Even hedgers who use options for price protection may offset their long option position sooner than originally expected. The time value recovered through offset lowers the expected cost of risk management. In this situation, the hedger will usually take another position in the cash, futures or option markets to ensure they still have price protection for the time period they want.

QUIZ 7

1. **The buyer of an option can:**

   (a) sell the option
   (b) exercise the option
   (c) allow the option to expire
   (d) all of the above

2. **Upon exercise, the seller of a call:**

   (a) acquires a long futures position
   (b) acquires a short futures position
   (c) acquires a put
   (d) must pay the option premium

3. **Funds must be deposited to a margin account by:**

   (a) the option seller
   (b) the option buyer
   (c) both the option buyer and the seller
   (d) neither the option buyer nor the seller

4. **Premiums for options are:**

   (a) specified in the option agreement
   (b) arrived at through competition between buyers and sellers
   (c) determined at the time an option is offset

5. **The components of option premiums are:**

   (a) intrinsic value, if any
   (b) time value, if any
   (c) the sum of (a) and (b)
   (d) the strike price and brokerage commission

6. **What two factors have the greatest influence on an option's premium?**

   (a) the length of time remaining until expiration and volatility
   (b) time and interest rates
   (c) interest rates and volatility

7. **Assume you pay a premium of 27 cents per bushel for a Soybean call with a strike price of $12.00. At the time, the futures price is $12.25. What is the option's time value?**

   (a) 2 cents/bu
   (b) 25 cents/bu
   (c) 27 cents/bu

8. **Assume the same facts as in question 7 except at expiration the futures price is $11.50. What is the option's intrinsic value?**

   (a) 50 cents/bu
   (b) 20 cents/bu
   (c) 0

9. **If you pay a premium of 10 cents per bushel for a Corn put option with a strike price of $6.60, what's the most you can lose?**

   (a) 10 cents/bu
   (b) $6.60/bu
   (c) your potential loss is unlimited

10. **If you sell (write) a call option and receive a premium of 30 cents per bushel, what's the most you can lose?**

    (a) 30 cents/bu
    (b) the initial margin deposit
    (c) your potential loss is unlimited

11. **Assume you pay a premium of 30 cents per bushel for a wheat call with a strike price of $6.00 and the futures price at expiration is $6.50. How much is the option in the money?**

    (a) 30 cents/bu
    (b) 50 cents/bu
    (c) 20 cents/bu
    (d) 80 cents/bu

See the answer guide at the back of this book.

CHAPTER 5 OPTION HEDGING STRATEGIES FOR BUYING COMMODITIES

Introduction to Risk Management Strategies

The primary purpose of Chapters 5 and 6 is to familiarize you with the many different ways in which options on agricultural futures can be used to achieve specific objectives. Upon completion of this section of the guide, you should be able to:

- Recognize situations in which options can be utilized
- Determine the most appropriate option strategy to accomplish a particular goal
- Calculate the dollars and cents outcome of any given strategy
- Compare options with alternative methods of pricing and risk management such as futures hedging and forward contracting
- Explain the risks that may be involved in any particular strategy

The strategies that are covered in Chapters 5 and 6 include:

Strategies for Commodity Buyers (Chapter 5)

1. Buy futures for protection against rising prices
2. Buy calls for protection against rising prices and opportunity if prices decline
3. Sell puts to lower your purchase price in a stable market
4. Buy a call and sell a put to establish a purchase price range
5. Cash purchase without risk management

Strategies for Commodity Sellers (Chapter 6)

1. Sell futures for protection against falling prices
2. Buy puts for protection against falling prices and opportunity if prices rally
3. Sell calls to increase your selling price in a stable market
4. Buy a put and sell a call to establish a selling price range
5. Cash sale without risk management

If you could describe options in one word, the word would be versatile. The better you understand options, the more versatile they become. You start to recognize opportunities for using options that otherwise may not have occurred to you. And, of course, the better you understand options, the more skillful you become in using them.

The key to using options successfully is your ability to match an appropriate strategy to a particular objective at a given time – like choosing the right "tool" to do a given job. Naturally, no individual is likely to use all possible option strategies for the simple reason that no individual is likely to have a need for every possible strategy. However, the pages that follow will suggest several situations in which the knowledge you have acquired about options will give you a significant advantage over those who are not familiar with the many benefits they offer.

As we indicated, the attractiveness of options lies in their versatility:

- They can be used for protection against declining prices or against rising prices
- They can be used to achieve short-term objectives or long-term objectives
- They can be used conservatively or aggressively

The strategy discussions in this section are intended to serve a dual purpose. The first is to demonstrate the versatility of options and help you achieve a higher level of familiarity with the mechanics of option trading. The second is to provide a "reference guide" to option strategies so that, as opportunities become available for using options, you can readily refer to the specific strategy or strategies that may be appropriate.

A suggestion: Rather than attempt, at the outset, to become a "master of every strategy," glance initially at the first paragraph of each strategy discussion, which describes the situation and objective for using the strategy. Then focus your attention on those strategies that seem most pertinent to your business and that correspond most closely to your objectives. You may want to come back to the others later to increase your knowledge of the many ways in which options can be used. You will note that every strategy discussion and illustration is followed by a brief quiz relating specifically to that strategy. This can serve as a useful test of your understanding.

Why Buy or Sell Options?

There are so many things you can do with options that the reasons for buying or selling them are as diversified as the marketplace itself.

In the case of purchasing options, hedgers typically buy them to achieve price protection. If you are worried prices will rise before you have a chance to purchase the physical commodity, you would buy a call option. Call options allow you to establish a ceiling price for a commodity you are planning to purchase. On the other hand, if you are worried prices will fall before you have a chance to sell your physical product or crop, you would buy a put option. Puts allow you to establish a minimum (floor) selling price.

In both cases, you're not locked in at the ceiling or floor price as you are with futures or forward contracting. If the market moves in a favorable direction after purchasing an option, you can abandon the option and take advantage of current prices. That is different than a futures hedge, which locks in a specific price. However, the cost of the option is deducted from (or added to) the final sale (or purchase) price.

Selling options is a little different. The reason people sell options can be stated in just a few words: to earn the option premium. This applies to both the writing of calls and of puts. Whether to write a call or a put depends largely on one's cash market position or price outlook.

Generally, call options are written by those who do not expect a substantial price increase. They may even be bearish in their price expectations. In any case, they hope the underlying futures price will not rise to a level that will cause the option to be exercised. If an option expires without being exercised, the option seller earns the full option premium.

Puts, on the other hand, are generally sold by those who do not expect a substantial decrease in price. They may even have a bullish outlook. They hope the underlying futures price will not fall to a level that will cause the option to be exercised. If the put expires without being exercised, the option seller earns the full option premium.

Instead of waiting, crossing your fingers in the hope an option will not be exercised, an option seller can always offset the option position before it expires. Under this scenario, the option seller would earn the price difference between the sale price and purchase price.

Which Option to Buy or Sell

A common denominator of all option strategies is the need to decide specifically which option to buy or sell: an option with a short time remaining until expiration or with a long time remaining until expiration? An option that is currently out-of-the-money, at-the-money or in-the-money? As you learned earlier, option premiums reflect both the time value remaining until expiration and the option strike price relation to the current underlying quoted futures price. It follows that different

options, therefore, have different risk-reward characteristics. Generally, the decision as to which option contract month to buy or sell will be dictated by the time frame of your objective. For example, if it is summer and your objective is to achieve protection against declining soybean prices between now and harvest, you would likely want to purchase a November put option. On the other hand, if it is winter and you want protection from a possible corn price decrease during the spring, you would probably want to purchase a May put option. As we discussed in the "Option Pricing" section of Chapter 4, the longer the time until the option expires, the higher the premium provided all other factors are equal.

When it comes to choosing the option strike price, however, there is no easy rule of thumb. Your decision may be influenced by such considerations as: In your judgment, what is likely to happen to the price of the underlying futures contract? How much risk are you willing to accept? And (if your objective is price protection), would you rather pay a smaller premium for less protection or a larger premium for more protection? Options, with a wide range of strike prices, provide a wide range of alternatives.

The following brief examples illustrate how and why.

Example 1

Assume it is late spring and you would like protection against lower soybean prices at harvest. The November futures price is currently quoted at $11.50. For a premium of 25 cents, you may be able to purchase a put option that lets you lock in a harvest time selling price of $11.50 plus your local basis. Or, for a premium of 15 cents, you may be able to buy a put that lets you lock in a harvest time selling price of $11.30 plus the basis. If prices subsequently decline, the higher-priced option provides you with more protection; but, if prices rise, the savings on the cost of the lower-priced option will add another 10 cents (the difference in the premiums) to your net selling price. In effect, it is similar to deciding whether to buy an automobile insurance policy with a small deductible or a larger deductible.

Example 2

Assume you decide to purchase a Corn call option for protection against a possible spring price increase. If the May futures price is currently $5.70 and you pay 8 cents for an out-of-the-money call with a $5.80 strike price, you will be protected from any price increase above $5.88 (strike price + premium). But, if you pay a premium of 15 cents for an at-the-money call with a strike price of $5.70, you will be protected from any price increase above $5.85 (strike price + premium). The out-of-the-money option, however, is cheaper than the at-the-money option – your out-of-pocket expense is the 8-cent premium (rather than the 15-cent premium) if prices decline rather than increase.

Example 3

In anticipation that wheat prices will remain steady or decrease slightly over the next four months, you decide to sell a call option to earn the option premium. If you are strongly bearish about the price outlook, you might want to earn a premium of 17 cents by writing an at-the-money $6.40 call. But, if you are only mildly bearish or neutral about the price outlook, you might wish to write an out-of-the-money $6.50 call at a premium of 13 cents. Although the premium income is less, the out-of-the-money call gives you a 10-cent "cushion" against the chance of rising prices. That is, you would still retain the full 13-cent premium if, at expiration, the futures price had risen to $6.50.

In each of these illustrations – and, indeed, in every option strategy – the choice is yours. The important thing is to be aware of the choices and how they affect the risks and rewards.

The Buyer of Commodities

Commodity buyers are responsible for the eventual purchase of physical raw commodities (e.g., corn, soybeans, wheat, oats) or derivatives of the raw commodities (e.g., soybean meal, soybean oil, fructose, flour). For example, commodity buyers can be food processors, feed manufacturers, feedlots, livestock producers, grain merchandisers or importers. They share a common risk – rising prices. Additionally, commodity buyers share a common need – price risk management. The following strategies illustrate a variety of strategies with varying degrees of risk management that can be used by commodity buyers.

Strategy #1: Buying Futures

Protection Against Rising Prices

The current time period is mid-summer and you need to purchase wheat during the first half of November. The Dec Wheat futures are trading at $6.50 per bushel. Your business can realize a profit at this price level but may sustain a loss if the prices rally much higher. To lock in this price, you take a long position in Dec Wheat futures. Although, you are protected if the prices move higher, you will not be able to benefit should the prices move to a lower price.

Based on historical basis records in your area, you expect the basis to be about 10 cents under the Dec Wheat futures price. As a buyer of commodities, your purchase price will improve if the basis weakens and worsen if the basis strengthens. For example, if the basis turns out to be stronger at 5 cents under, then your purchase price will be 5 cents higher than expected. If the basis weakens to 20 cents under, then your purchase price will be 10 cents lower than expected.

Action

In August you purchase a Dec Wheat futures contract at $6.50 per bushel.

Expected purchase price =
futures price +/– expected basis
$6.50 – .10 = $6.40/bushel

Results

Assuming basis turns out to be 10 cents under December futures in November and the Dec Wheat futures move above $6.50 per bushel, the higher price you pay for the physical wheat will be offset by a gain in your futures position. If Dec Wheat futures moves below $6.50 per bushel, you will pay a lower price for the physical wheat but you will have a loss on your long futures position. Note the different price scenarios for the November time period. Regardless, if Dec Wheat futures moves higher or lower, the effective purchase price will be $6.40 per bushel provided the basis turns out to be 10 cents under. A change in the basis will affect the purchase price.

LONG DECEMBER WHEAT FUTURES AT $9.50 PER BUSHEL

If Dec Wheat futures are:	Basis	Cash price	Long futures gain(–)/loss(+)	Actual buying price
$6.00	–$.10	$5.90	+$.50 (L)	$6.40
$6.25	–$.10	$6.15	+$.25 (L)	$6.40
$6.50	–$.10	$6.40	$0	$6.40
$6.75	–$.10	$6.65	–$.25 (G)	$6.40
$7.00	–$.10	$6.90	–$.50 (G)	$6.40

Strategy #2: Buying Call Options

Protection Against Higher Prices and Opportunity if Prices Decline

Assume you are a buyer who needs to establish a wheat purchase price for November delivery. The time is August and the Dec Wheat futures price is $6.50 per bushel. At this level, you decide to use options to protect your flour purchase price and related profit margins against a significant rise in the price of wheat. By buying call options you'll be protected from a price increase yet retain the downside opportunity should prices fall between now and November.

The cash market price for wheat in your region is typically about 10 cents below the December futures price during November. This means the normal basis during late fall is 10 cents under, and, given the current market conditions, you expect this to hold true this year. Therefore, if the December futures price in November is $6.50, the cash price in your suppliers' buying region is expected to be about $6.40 per bushel.

Premiums for Dec Wheat call and put options are currently quoted as follows:

Option strike price	Call option premium	Put option premium
$6.10	$.41	$.01
$6.20	$.33	$.04
$6.30	$.27	$.08
$6.40	$.21	$.12
$6.50	$.15	$.16
$6.60	$.11	$.22
$6.70	$.07	$.28
$6.80	$.03	$.34
$6.90	$.01	$.41

Expected Buying Price

To compare the price risk exposure for different call option strikes simply use the following formula:

Maximum (ceiling) buying price =
call strike price + premium paid +/– basis

In the current example, the comparison between the $6.40 call and the $6.50 call would be:

Call	+	Premium	–	Basis	=	Ceiling price
$6.40	+	$.21	–	$.10	=	$6.51
$6.50	+	$.15	–	$.10	=	$6.55

As you can see, greater price protection involves a somewhat higher cost.

Action

After considering the various option alternatives, you purchase the $6.50 call for 15 cents, which provides protection above the current market price level.

Scenario #1: Prices Rise

If prices rise, and assuming the basis remains unchanged at 10 cents under, you will pay a maximum of $6.55 per bushel for wheat. That is, the option strike price ($6.50) plus the premium paid for the option (15 cents) less the basis (10 cents under).

Assume the December futures price has risen to $7.50 and your supplier is offering cash wheat at $7.40 ($7.50 futures price – $.10 basis).

With the futures price at $7.50, the call option with a strike price of $6.50 can be sold for at least its intrinsic value of $1.00. Deducting the 15-cent premium paid for the option gives you a net gain of 85 cents per bushel. The cash market price of $7.40 less the 85-cent gain gives you an effective buying price of $6.55 per bushel.

Scenario #2: Prices Decrease

If Dec Wheat futures prices decrease below the $6.50 strike price, your option will have no intrinsic value but may have some remaining time value. To receive the remaining time value and lower the purchase price, you should attempt to offset the option. Your net wheat flour price will be directly related to the cash price for wheat plus the premium you initially paid for the option minus any time value you recover. If the option has no time value, you can allow the option to expire worthless.

For example, assume the Dec Wheat futures price has decreased to $6.00 at the time you procure your cash wheat and your supplier is offering a local price of $5.90 (futures price less the basis of 10 cents under). You allow the option to expire since it has no intrinsic or time value. The net price you pay for wheat, equals $6.05 ($5.90 cash price + $.15 option premium paid). Whether the market price has gone up or down, the following formula allows you to calculate the net price for the basic ingredient (wheat in this scenario) you are buying:

	Futures price when you purchase the ingredient
+/–	Local basis at the time of your purchase
+	Premium paid for the option
–	Premium received when option offset (if any)
=	**Net purchase price**

Results

Note the different price scenarios for the November time period. Regardless of the price increase in cash wheat, the maximum purchase price is $6.55 per bushel because of the increasing profits in the long call option position. As prices decline, the wheat buyer continues to improve on the effective buying price.

QUIZ 8

1. **Assume you pay a premium of 13 cents per bushel for a Jan Soybean call with a $12.40 strike price, and the basis is 20 cents over in December. What is the net price for soybeans if the Jan Soybean futures price in December is the price shown in the left-hand column?**

January soybean futures	Net price
$12.20	$_____per bu
$12.80	$_____per bu
$13.40	$_____per bu

2. **Assume you buy a Mar Corn call option with a strike price of $5.30 at a premium cost of 8 cents a bushel. Also assume, in February, your corn supplier usually quotes you a price of 10 cents under March futures. What would your net price be if the March futures price in February is the price shown in the left-hand column?**

March futures price	Net price
$5.80	$_____per bu
$5.60	$_____per bu
$5.20	$_____per bu

See the answer guide at the back of this book.

LONG $6.50 DECEMBER WHEAT CALL AT $.15 PER BUSHEL PREMIUM

If Dec Wheat futures are:	Basis	Cash price	Long call gain(–)/loss(+)	Effective buying price
$6.00	–$.10	$5.90	+$.15 (L)	$6.05
$6.25	–$.10	$6.15	+$.15 (L)	$6.30
$6.50	–$.10	$6.40	+$.15 (L)	$6.55
$6.75	–$.10	$6.65	–$.10 (G)	$6.55
$7.00	–$.10	$6.90	–$.35 (G)	$6.55

Strategy #3: Selling Put Options

Lower Your Buying Price in a Stable Market

If you anticipate the market remaining stable, you can lower the buying price of your ingredients by selling (going "short") a put option. By selling a put option as a commodity buyer, you can lower the purchase price of your ingredients by the amount of premium received provided the market remains relatively stable.

If the futures market falls below the put's strike price, you'll be able to buy the cash commodity at a lower price than you originally expected (the cash and futures markets generally move parallel to each other), but you will lose on the short put. If the futures market falls below the strike price by more than the premium collected, your losses on the short put offset the lower price paid to your supplier. If the futures market rallies, the only protection you have against the higher cash price is the premium collected from selling the put. Also, because selling options involves market obligations, performance bond/margin funds must be posted with your broker.

Action

Assume again you are a wheat buyer for a food manufacturer that needs to establish a price for mid-November delivery. It is August, the Dec Wheat futures price is $6.50 per bushel, and you expect wheat prices to trade in a narrow range through the next several months. Also, assume out-of-the-money Dec Wheat puts (i.e., strike price of $6.30) are trading at 8 cents a bushel. The expected basis is 10 cents under December. You decide to sell December $6.30 puts to reduce the actual price you pay for cash wheat between now and November. (The December contract is used because it most closely follows the time you plan to take delivery of your ingredients.)

To calculate the expected floor purchase price simply use the following formula:

Minimum (floor) buying price =
put strike price – premium received +/–
expected basis
$6.30 put strike – $.08 premium – $.10 basis = $6.12

With this strategy, the effective purchase price will increase if the futures price rises above the put strike price. Once that happens, your protection is limited to the premium received and you will pay a higher price for wheat in the cash market.

If Dec Wheat futures are:	–	Actual basis	=	Cash price	+/–	Short put gain(–)/loss(+)	=	Net buying price
$6.00	–	$.10	=	$5.90	+	$.22 (L)	=	$6.12
$6.25	–	$.10	=	$6.15	–	$.03 (G)	=	$6.12
$6.50	–	$.10	=	$6.40	–	$.08 (G)	=	$6.32
$6.75	–	$.10	=	$6.65	–	$.08 (G)	=	$6.57
$7.00	–	$.10	=	$6.90	–	$.08 (G)	=	$6.82

QUIZ 9

1. **If you sell an Oct Soybean Oil put with a strike price of 55 cents for 1 cent per pound and the expected basis is $.005/lb under October, what is your expected net floor and ceiling price?**

   Ceiling price _____

   Floor price _____

2. **What is your gain or loss on the 55-cent Soybean Oil put option you sold if: (Note: Assume it is close to option expiration and there is no remaining time value.)**

Futures price is:	Put gain/loss	Futures price is:	gain/loss
$.52	_____	$.55	_____
$.53	_____	$.56	_____
$.54	_____	$.57	_____

3. **Using your answers from Question 2, what will be the effective purchase price for Soybean Oil if: (Note: Assume the basis is $.01/lb under October and it is close to option expiration so there is no remaining time value.)**

Futures price is:	Effective purchase price	Futures price is:	Effective purchase price
$.52	$_____ per lb	$.55	$_____ per lb
$.53	$_____ per lb	$.56	$_____ per lb
$.54	$_____ per lb	$.57	$_____ per lb

See the answer guide at the back of this book.

Results

Your effective buying price will depend on the actual futures price and basis (10 cents under as expected) when you purchase your cash wheat. In this example, the previous table lists the net wheat prices as a result of various futures price levels.

As the equation indicates, after adjusting for the basis, premium received from the sale of the puts reduces the effective purchase price of wheat. But there are risks when selling options. If prices fall below the put strike price, there is the possibility you will be exercised against and assigned a long futures position at any time during the life of the option position. This would result in a position loss equal to the difference between the strike price and the futures market price. This loss offsets the benefit of a falling cash market, effectively establishing a floor price level. In contrast, if the market price increases, your upside protection is limited only to the amount of premium collected.

Strategy #4: Buy a Call and Sell a Put

Establish a Buying Price Range

This long hedging strategy provides you with a buying price range. Purchasing a call option creates a ceiling price and selling a put establishes a floor price. The strike prices of the options determines your price range. You would choose a lower strike price for the put option (i.e., a floor price) and a higher strike price for the call option (i.e., a ceiling price). As with all strategies, the range selected depends on your company's price objectives and risk exposure. The premium received from selling the put allows you to reduce the premium cost of the call. You effectively lower the ceiling price by selling the put.

Once more, assume you are buying wheat for your firm and

decide to use wheat options to establish a price range for requirements between August and November. As described in Strategy #1, Dec Wheat futures are at $6.50 a bushel and the expected buying basis in November is generally 10 cents under Dec Wheat futures. The premiums for the Dec Wheat call and put options (the same as used in Strategies #2 and #3) are:

Strike price	Call option premium	Put option premium
$6.10	$.41	$.01
$6.20	$.33	$.04
$6.30	$.27	$.08
$6.40	$.21	$.12
$6.50	$.15	$.16
$6.60	$.11	$.22
$6.70	$.07	$.28
$6.80	$.03	$.34
$6.90	$.01	$.41

Action

You first need to calculate the "buying price range" that fits your risk tolerance level. This is done by using the following formulas.

Maximum (ceiling) purchase price =
call strike price + call premium paid – put premium received +/– expected basis

Minimum (floor) purchase price =
put strike price + call premium paid – put premium received +/– expected basis

Using these formulas and the various option premiums, you can calculate different buying ranges based upon the strike prices chosen. The greater the difference between the call and put strike prices, the wider the purchase price range. Conversely, a smaller difference in the strike prices will result in a narrower purchase price range.

After considering various options, you decide to establish a buying price range by purchasing a $6.50 call for 15 cents and selling a $6.30 put for 8 cents. The call option was initially at-the-money and the put option was initially out-of-the-money.

Results

Regardless of what the futures market does, your net buying price will be no more than $6.47 ($6.50 call strike + $.15 call premium paid – $.08 put premium received – $.10 basis) and no less than $6.27 ($6.30 put strike + $.15 call premium paid – $.08 put premium received – $.10 basis), subject to any variation in the basis. The price range is 20 cents because this is the difference between the call and put strike prices.

Looking at the net results based on different futures prices scenarios in the table below confirms the establishment of a buying price range.

If Dec Wheat futures are:	–	Actual basis	=	Cash price	+/ –	Long $6.50 call gain(–)/loss(+)	+/ –	Short $6.30 put gain(–)/loss(+)	=	Net buying price
$6.00	–	$.10	=	$5.90	+	.15 (L)	+	$.22 (L)	=	$6.27
$6.25	–	$.10	=	$6.15	+	.15 (L)	–	$.03 (G)	=	$6.27
$6.50	–	$.10	=	$6.40	+	.15 (L)	–	$.08 (G)	=	$6.47
$6.75	–	$.10	=	$6.65	–	10 (G)	–	$.08 (G)	=	$6.47
$7.00	–	$.10	=	$6.90	–	.35 (G)	–	$.08 (G)	=	$6.47

*Long call option gain/loss = futures price – call strike price – call premium paid; maximum loss = premium paid
*Short put option gain/loss = futures price – put strike price + put premium received; maximum put profit = premium received

QUIZ 10

1. **Assume you are a soybean buyer wanting to establish a buying price range. This time, you purchased a $12.00 Mar Soybean call for 15 cents and sold a $11.50 Mar Soybean put for 5 cents. The expected basis is 20 cents over the Mar Soybean futures price.**

   What is your buying price range?

   Ceiling price_____ Floor price_____

2. **What is the gain or loss on the $12.00 call option you purchased if: (Note: Assume it is close to option expiration and there is no remaining time value.)**

Futures price is:	Call gain/loss
$11.00	_____
$11.50	_____
$12.00	_____
$12.50	_____
$13.00	_____

3. **What is the gain or loss on the $11.50 put option you sold if: (Note: Assume it is close to option expiration and there is no remaining time value.)**

Futures price is:	Put gain/loss
$11.00	_____
$11.50	_____
$12.00	_____
$12.50	_____
$13.00	_____

4. **Using your answers from Questions 2 and 3, what will be the effective purchase price if: (Note: Assume the actual basis is $.20/bu over the Mar Soybean futures price and it is close to option expiration so there is no remaining time value.)**

Futures price is:	Effective purchase price
$11.00	$_____ per bu
$11.50	$_____ per bu
$12.00	$_____ per bu
$12.50	$_____ per bu
$13.00	$_____ per bu

See the answer guide at the back of this book.

Comparing Commodity Purchasing Strategies

A commodity buyer should realize that there isn't one "perfect" strategy for all firms or for all market conditions. Different economic conditions require different purchasing strategies. Therefore, an astute commodity buyer should become familiar with all of the available purchasing strategies. They should learn how to evaluate and compare the strategies, and sometimes realize that a strategy may need to be revised, even in the middle of a purchasing cycle, due to changing market conditions.

The purchasing strategies we looked at in this chapter are some of the more common ones, but by no means, are they to be considered a complete list of purchasing strategies. Each firm with their own risk/reward profiles will have to make a decision – which strategy is the best for their needs.

The following chart compares four purchasing strategies involving futures or options and one strategy without price risk management. Each of the strategies has strengths and weaknesses, which will be discussed in the following paragraphs.

Note: All of the following strategies being compared assume a basis of 10 cents under the Dec Wheat futures contract. If the basis turns out to be anything other than 10 cents under the December contract, the effective purchase price will be different. A stronger basis would increase the purchase price and a weaker than expected basis would lower the effective purchase price.

Long Futures

The long futures position is the most basic price risk management strategy for a commodity buyer. This strategy allows the commodity buyer to "lock in a price level" in advance of the actual purchase. It provides protection against the risk of rising prices but does not allow improvement in the purchase price should the market decline. This position requires the payment of a broker's commission as well as the costs associated with maintaining a performance bond/margin account. In the following table, the long futures position fares the best when the market moves higher (i.e., when the price risk occurs).

Long Call Option

The long call option position provides protection against rising commodity prices but also allows the buyer to improve on the purchase price if the market declines. The long call position "establishes a maximum (ceiling) price level." The protection and opportunity of a long call option position comes at a cost – the call option buyer must pay the option premium at the time of the purchase. In the table, the long call option provides upside price protection similar to the long futures position except at a cost. Unlike the long futures position, the long call option nets a better purchase price when the market declines. The long call option does not require performance bond/margin.

Short Put Option

Although the short put option position is the riskiest of the strategies that we covered in this publication, it provides the best purchase price in a stable market, as seen in the table. However, if the market declines, the put option "establishes a minimum (floor) purchase price level." The worse case scenario for this strategy is if the market rallies because the upside protection is limited to the premium collected for selling the put. The short put strategy requires performance bond/margin.

Long Call Option and Short Put Option

By combining the short put position with the long call position, the commodity buyer establishes a lower ceiling price level because of the premium received for selling the put. However, the cost of this benefit is that the short put position limits the opportunity of lower prices by establishing a floor price level. Effectively, the commodity buyer "established a purchase price range" with this strategy. The price range is determined by the strike prices and therefore can be adjusted (widened or narrowed) by choosing alternative strike prices. After the long futures position, this strategy provided the most protection against rising prices, as noted in the table.

Do Nothing

Doing nothing to manage purchasing price risk is the most simplistic strategy for a commodity buyer – but also the most dangerous should the market rally. Doing nothing will yield the best purchase price as the market declines but "provides zero risk management" against a rising market, as indicated in the table.

Other Purchasing Strategies

There are many other purchasing strategies available to a commodity buyer. These strategies may involve futures, options or cash market positions and each will have their own set of advantages and disadvantages. As stated earlier in this chapter, a good commodity buyer should acquaint themselves with all of their alternatives and understand when a specific strategy should be employed or revised. Remember, a strategy that worked effectively for one commodity purchase may not be the best for your next commodity purchase.

If Dec Wheat futures are:	Long futures	Long call	Short put	Long call/ short put	Do nothing
$6.00	$6.40	$6.05	$6.12	$6.27	$5.90
$6.25	$6.40	$6.30	$6.12	$6.27	$6.15
$6.50	$6.40	$6.55	$6.32	$6.47	$6.40
$6.75	$6.40	$6.55	$6.57	$6.47	$6.65
$7.00	$6.40	$6.55	$6.82	$6.47	$6.90

CHAPTER 6 OPTION HEDGING STRATEGIES FOR SELLING COMMODITIES

The Seller of Commodities

Commodity sellers, similar to commodity buyers, are potential hedgers because of their need to manage price risk. Commodity sellers are individuals or firms responsible for the eventual sale of the physical raw commodities (e.g., wheat, rice, corn) or derivatives of the raw commodities (e.g., soybean meal, flour). For example, commodity sellers can be farmers, grain elevators, grain cooperatives or exporters. Although they have different functions in the agricultural industry, they share a common risk – falling prices and a common need to manage that price risk. The following strategies for commodity sellers provide different risk management benefits.

Strategy #1: Selling Futures

Protection Against Falling Prices

As a soybean producer, who just completed planting, you are concerned that prices will decline between spring and harvest. With Nov Soybean futures currently trading at $11.50 per bushel and your expected harvest basis of 25 cents under Nov Soybean futures, the market is at a profitable price level for your farm operation. To lock in this price level, you take a short position in Nov Soybean futures. Although you are protected should the prices move lower than $11.50, this strategy will not allow you to improve your selling price if the market moves higher.

A short futures position will increase in value to offset a lower cash selling price as the market declines and it will decrease in value to offset a higher cash selling price as the market rallies. Basically, a short future position locks in the same price level regardless of which direction the market moves.

The only factor that will alter the eventual selling price is a change in the basis. If the basis turns out to be stronger than the expected 25 cents under, then the effective selling price will be higher. For example, if the basis turns out to be 18 cents under November at the time you sell your soybeans, the effective selling price will be 7 cents better than expected. If the basis weakens to 31 cents under at the time of the cash soybean sale, then the effective selling price will be 6 cents lower than expected.

Action

In the spring, you sell Nov Soybean futures at $11.50 per bushel.

Expected selling price =
futures price +/– expected basis = $11.50 – .25 = $11.25/bushel

SHORT NOVEMBER SOYBEAN FUTURES AT $11.50 PER BUSHEL

If Nov Soybean futures are:	+/ –	Basis	=	Cash price	+/ –	Short futures gain(+)/loss(–)	=	Actual selling price
$10.50	–	$.25	=	$10.25	+	$1.00 (G)	=	$11.25
$11.00	–	$.25	=	$10.75	+	$ .50 (G)	=	$11.25
$11.50	–	$.25	=	$11.25		0	=	$11.25
$12.00	–	$.25	=	$11.75	–	$ .50 (L)	=	$11.25
$12.50	–	$.25	=	$12.25	–	$1.00 (L)	=	$11.25

Results

Assuming the Nov Soybean futures drop below $11.50 at harvest and the basis is 25 cents under, as expected, the lower price you receive for your cash soybeans would be offset by a gain in your short futures position. If Nov Soybean futures rally above $11.50 and the basis is 25 cents under, the higher selling price you receive for the soybeans will be offset by a loss on the short futures position.

Note the different price scenarios for the harvest time period (October) in the previous table. Regardless of the Nov Soybean futures moving higher or lower, the effective cash selling price will be $11.25 per bushel if the basis is 25 cents under. Any change in the basis will alter the effective selling price.

If the basis was stronger (20 cents under) when futures were at $10.50, the effective selling price would have been $11.30. If the basis weakened (30 cents under) when futures were at $12.50, the effective selling price would have been $11.20.

Strategy #2: Buying Put Options

Protection Against Lower Prices and Opportunity if Prices Rally

As a soybean producer whose crop has just been planted, you are concerned that there may be a sharp decline in prices by harvest in October. You would like to have protection against lower prices without giving up the opportunity to profit if prices increase. At the present time, the November futures price is quoted at $11.50 per bushel. The basis in your area during October is normally 25 cents under the Nov Soybean futures price. Thus, if the November futures price in October is $11.50, local buyers are likely to be bidding about $11.25.

Premiums for Nov Soybean put and call options with various strike prices are presently quoted as follows:

Put option strike price	Put option premium	Call option premium
$11.00	$.10	$.61
$11.20	$.19	$.51
$11.50	$.30	$.31
$11.80	$.49	$.21
$12.00	$.60	$.12

Expected Selling Price

To evaluate the expected minimum (floor) selling price and compare the price risk exposure from the various put options, use the following formula:

Minimum (floor) selling price =
put strike – premium paid +/– expected basis

Comparing two of the put options from the previous chart:

$11.80 (strike)
– $.49 (premium paid)
– $.25 (expected basis)
= $11.06 floor selling price

$11.50 (strike)
– $.30 (premium paid)
– $.25 (expected basis)
= $10.95 floor selling price

As you can see, the greater protection comes from the put option with the higher strike prices and therefore, the greatest premium.

Action

You decide to use options to manage your price risk. After considering the various options available, you buy the $11.50 put (at-the-money) at a premium of 30 cents a bushel.

Scenario #1: Prices Decline

If prices decline and assuming the basis remains unchanged at 25 cents under, you will receive a minimum $10.95 per bushel for your crop. That is the option strike price ($11.50) minus the expected basis (25 cents) less the premium paid for the option (30 cents).

Assume the November futures price has declined to $10.50, and local buyers are paying $10.25 (futures price – the basis of $.25 under).

With the futures price at $10.50, the $11.50 put option can be sold for at least its intrinsic value of $1.00. Deducting the 30 cents you paid for the option gives you a net gain of 70 cents. That, added to the total cash market price of $10.25, gives you a total net return of $10.95 per bushel.

Scenario #2: Prices Increase

If prices increase, you will allow your put option to expire if there isn't any time value, because the right to sell at $11.50 when futures prices are in excess of $11.50 has no intrinsic value. Your net return will be whatever amount local buyers are paying for the crop less the premium you initially paid for the option.

Assume the futures price when you sell your crop has increased to $13.00, and local buyers are paying $12.75 (futures price – the basis of $.25 under).

You would either allow the option to expire if there isn't any time value or offset the put option if there is time value remaining. If you allow the put option to expire, your net return will be $12.45 (local cash market price of $12.75 – the $.30 premium paid).

Regardless of whether prices have decreased or increased, there is an easy way to calculate your net return when you sell your crop:

Futures price when you sell your crop
+/– Local basis at the time you sell
– Premium paid for the option
+ Option value when option offset (if any)
= Net selling price

Results

Note the different price scenarios for the October time period. Regardless of the price decline in soybeans, the minimum selling price is $10.95 per bushel because of the increasing profits in the long put option position. As prices rally, the soybean seller continues to improve on the effective selling price. In other words, the soybean seller has protection and opportunity.

LONG $11.50 NOVEMBER SOYBEAN PUT AT $.30 PER BUSHEL PREMIUM

If Nov Soybean futures are:	+/–	Basis	=	Cash price	+/–	Long Put gain(+)/loss(–)	=	Actual selling price
$10.50	–	$.25	=	$10.25	+	.70(G)	=	$10.95
$11.00	–	$.25	=	$10.75	+	.20(G)	=	$10.95
$11.50	–	$.25	=	$11.25	–	.30(L)	=	$10.95
$12.00	–	$.25	=	$11.75	–	.30(L)	=	$11.45
$12.50	–	$.25	=	$12.25	–	.30(L)	=	$11.95

QUIZ 11

1. **Assume that you pay a premium of 30 cents a bushel for a Nov Soybean put option with a $12.50 strike price, and the basis is expected to be 25 cents under November futures when you sell your crop in October. What would your selling price be if the Nov Soybean futures price at expiration (i.e., no time value) is the price shown in the left-hand column?**

November futures price	Net return
$11.80	$ _____ per bu
$12.60	$ _____ per bu
$14.30	$ _____ per bu

2. **Assume you buy a Sep Corn put option with a strike price of $6.70 at a premium cost of 8 cents a bushel. Also, assume your local basis is expected to be 10 cents under September futures in August. What would your selling price be if the September futures price at expiration is the price shown in the left-hand column?**

September futures price	Net return
$6.40	$ _____ per bu
$6.70	$ _____ per bu
$7.00	$ _____ per bu

See the answer guide at the back of this book.

Strategy #3: Selling Call Options

Increase Your Selling Price in a Stable Market

If you are expecting a relatively stable market, you can increase your selling price by selling (going short) a call option. As a commodity seller, you will increase the effective selling price by the amount of premium collected when you sell call options.

If the futures market price increases above the call strike price, you will be able to sell the cash commodity at a better price but you will begin to lose on the short call option position. If the market rallies above the call strike price by an amount greater than the premium collected, the losses on the short call will outweigh the increased cash selling price. As a result, this strategy locks in a maximum (ceiling) selling price level.

If the futures market declines below the strike price, the only protection you have against falling prices is the premium collected from selling the call option. Note, that by selling options, you have a market obligation and therefore you will be required to maintain a performance bond/margin account. Additionally, as an option seller, you may be exercised on at any time during the life of the option. As with all risk management strategies, the effective selling price will be affected by any change in the expected basis.

Action

Assume you are a soybean producer who is planning to deliver soybeans in October at harvest and expect the harvest basis to be 25 cents under the Nov Soybean futures. Nov Soybean futures are currently trading at $11.50 per bushel and you don't expect very much price movement in the months leading up to harvest. To enhance your effective selling price, you decide to sell the $11.80 Nov Soybean call option (out-of the-money) for a premium of 21 cents per bushel.

Use the following formula to evaluate this strategy. This formula should also be used to compare this type of strategy using different strike prices:

Expected maximum (ceiling) selling price

Call option strike price	$11.80
+ Premium Received	+.21
+/– Expected Basis	–.25
	$11.76

With this strategy, the effective selling price will decrease if the futures price falls below the call strike price. Once that happens, your price protection is limited to the premium collected and you will receive a lower selling price in the cash market.

Results

Your effective selling price will depend on the futures price and the actual basis when you sell your cash commodity. In this example, the following table lists the effective selling prices for a variety of futures price scenarios.

As the formula indicates, after adjusting for the actual basis, the premium received from the sale of the call increases the effective selling price. But note that there are risks associated with selling options. If prices rally above the call strike price, there is the possibility that you will be exercised on and assigned a short futures position at any time during the life of the call option. As the market rallies, the losses sustained on the short call position will offset the benefits of a higher cash price, thereby establishing a ceiling selling price ($11.76). In contrast, if the market prices decline, your downside price protection is limited to the amount of premium collected.

SHORT $11.80 CALL OPTION FOR $.21 PREMIUM: SCENARIOS

If Nov Soybean futures are:	+/ –	Basis	=	Cash price	+/ –	Short futures gain(+)/loss(–)	=	Net selling price
$10.50	–	$.25	=	$10.25	+	$.21 (G)	=	$10.46
$11.00	–	$.25	=	$10.75	+	$.21 (G)	=	$10.96
$11.50	–	$.25	=	$11.25	+	$.21 (G)	=	$11.46
$12.00	–	$.25	=	$11.75	+	$.01 (G)	=	$11.76
$12.50	–	$.25	=	$12.25	–	$.49 (L)	=	$11.76

Strategy #4: Buy a Put and Sell a Call

Establish a Selling Price Range

This is a short hedging strategy with the net effect of creating both a floor price and a ceiling price. Let's assume you are a soybean farmer and you have just planted your crop. The November Soybean futures contract is trading at $11.50 per bushel, and you anticipate the local basis to be 25 cents under by harvest. You like the idea of having downside price protection but if there is a market rally between now and fall, you won't be able to take advantage of it if you're short futures. Instead, you decide to buy a put option. You have downside protection but are not locked in if prices rise. The only catch is the option premiums are a little higher than what you'd like to spend. What you can do to offset some of the option cost is establish a "fence" or "combination" strategy. With this type of strategy, you buy a put and offset some of the premium cost by selling an out-of-the-money call option.

However, this strategy establishes a selling price range where you can't benefit from a price rally beyond the call strike price. The premiums for the Nov Soybean put options and the Nov Soybean call options are:

Strike price	Put option premium	Call option premium
$11.00	$.10	$.61
$11.20	$.19	$.51
$11.50	$.30	$.31
$11.80	$.49	$.21
$12.00	$.60	$.12

Action

The first step would be to calculate "the selling price range" under various option scenarios. This is easily done by using the following formulas:

Floor price level =
Put strike price – put premium + call premium +/– expected basis

Ceiling price level =
call strike price – put premium + call premium +/– expected basis

After considering various alternatives, you decide to buy an at-the-money $11.50 put for 30 cents and sell an out-of-the-money $11.80 call for 21 cents. The strategy can be put on for a net debit of 9 cents per bushel, and the selling price range is well within your projected production costs plus profit margin.

LONG $11.50 PUT AND SHORT $11.80 CALL: SCENARIOS

If Nov Soybean futures are:	–	Actual basis	=	Cash price	+/ –	Long put gain(+)/loss(–)*	+/ –	Short call gain(+)/loss(–)**	=	Net selling price
$10.50	–	$.25	=	$10.25	+	$.70 (G)	+	$.21 (G)	=	$11.16
$11.00	–	$.25	=	$10.75	+	$.20 (G)	+	$.21 (G)	=	$11.16
$11.50	–	$.25	=	$11.25	–	$.30 (L)	+	$.21 (G)	=	$11.16
$12.00	–	$.25	=	$11.75	–	$.30 (L)	+	$.01 (G)	=	$11.46
$12.50	–	$.25	=	$12.25	–	$.30 (L)	–	$.49 (L)	=	$11.46

* Long put option gain/loss = put strike price – futures price – put premiums; maximum cost (loss) = premium paid
** Short call option gain/loss = call strike price – futures price + call premiums; maximum gain = premium received

Results

As shown in the table above, your net selling price will vary depending on what the Nov Soybean futures price and the basis are when you offset your combination put/call (fence) strategy. What is interesting, is with the long put/short call strategy the net selling price will be anywhere from $11.16 to $11.46 provided the basis is 25 cents under.

QUIZ 12

1. **Assume you are a soybean producer wanting to establish a selling price range. You purchase a $10.00 put for 11 cents and sell a $11.00 call for 12 cents. The expected basis is 25 cents under Nov Soybean futures.**

   What is your anticipated selling price range?

   Floor price_____ Ceiling price_____

2. **What is the gain or loss on the $10.00 put option if: (Note: Assume it is close to option expiration and there is no remaining time value.)**

Futures price is:	Put gain/loss
$9.25	_____
$9.50	_____
$10.75	_____
$11.00	_____
$11.25	_____

3. **What is the gain or loss on the $11.00 call option if: (Note: Assume it is close to option expiration so the option has no remaining time value.)**

Futures price is:	Call gain/loss
$9.25	_____
$9.50	_____
$10.75	_____
$11.00	_____
$11.25	_____

4. **Using your answers from Questions 2 and 3, what will be the effective selling price for soybeans if: (Note: Assume the actual basis is $.30/bu under the Nov Soybean futures price and it is close to option expiration, so the option has no remaining time value.)**

Futures price is:	Effective selling price
$9.25	$_____ per bu
$9.50	$_____ per bu
$10.75	$_____ per bu
$11.00	$_____ per bu
$11.25	$_____ per bu

See the answer guide at the back of this book.

Comparing Commodity Selling Strategies

A commodity seller doesn't have one "perfect" strategy that will fit all market conditions. You need to realize that different economic conditions require different selling strategies. Therefore, a smart seller of commodities should become familiar with all of the available selling strategies. They should learn how to evaluate and compare the strategies, and sometimes realize that a strategy may need to be revised due to changing market conditions.

The commodity selling strategies we looked at in this chapter are fairly common ones, but by no means, are they to be considered an all inclusive list of selling strategies. Each individual or firm, with their own risk/reward profiles, will have to make the ultimate decision – what strategy is the best for their risk management needs.

The following table compares four commodity selling strategies involving futures or options and one strategy not involving price risk management. Each of the strategies has their own strengths and weaknesses, which will be discussed in the following paragraphs.

If Nov Soybean futures are:	Short futures	Long put	Short call	Long put/ short call	Do nothing
$10.50	$11.25	$10.95	$10.46	$11.16	$10.25
$11.00	$11.25	$10.95	$10.96	$11.16	$10.75
$11.50	$11.25	$10.95	$11.46	$11.16	$11.25
$12.00	$11.25	$11.45	$11.76	$11.46	$11.75
$12.50	$11.25	$11.95	$11.76	$11.46	$12.25

Note: All of the strategies being compared assume a basis of 25 cents under the November futures contract. If the basis turns out to be anything other than 25 cents under the November futures contract, the effective selling price will be different. A stronger basis would increase the selling price and a weaker than expected basis would lower the effective selling price.

Short Futures

The short futures position is the most basic price risk management strategy for a commodity seller. This strategy allows the commodity seller to "lock in a price level" in advance of the actual sale. It provides protection against the risk of falling prices but does not allow improvement in the selling price should the market rally. This position requires the payment of a broker's commission, as well as the costs associated with maintaining a performance bond/margin account. In the comparison table, the short futures position fares the best when the risk occurs as the market moves lower.

Long Put Option

The long put option position provides protection against falling commodity prices but also allows the seller to improve on the selling price if the market rallies. The long put position "establishes a minimum (floor) selling price level." The protection and opportunity of a long put option position comes at a cost – the put option buyer must pay the option premium. In the comparison chart, the long put option provides upside price protection similar to the short futures position with the difference being the cost of the protection – the premium. Unlike the short futures position, the long put option nets a better selling price when the market rallies. When buying a put option, you must pay a brokerage commission but you do not have a performance bond/margin account to maintain.

Short Call Option

Although the short call option position is the riskiest of the selling strategies covered in this section, it provides the best selling price in a stable market, as seen in the comparison table. However, if the futures market price increases, the short call option "establishes a maximum (ceiling) selling price level." The worse case scenario for this strategy is if the market declines significantly because the downside protection is limited to the premium collected for selling the call.

Long Put Option and Short Call Option

By combining the short call position with the long put position, the commodity seller establishes a higher floor price level because of the premium received for selling the call. However, the cost of this benefit is that the short call position limits the opportunity of higher prices by establishing a ceiling price level. Effectively, the commodity seller using this strategy "establishes a selling price range." The selling price range is determined by the strike prices and therefore can be adjusted (widened or narrowed) by choosing alternative strike prices. Next to the short futures position, this strategy provides the most protection against falling prices, as noted in the comparison table.

Do Nothing

Doing nothing to manage price risk is the most simplistic strategy for a commodity seller – but also the most dangerous should the market decline. Doing nothing will yield the best selling price as the market rallies but "provides zero price risk management" against a falling market, as indicated in the comparison table.

Other Strategies for Selling Commodities

There are many other strategies available to a commodity seller. These strategies may involve futures, options or cash market positions and each will have their own set of advantages and disadvantages. As stated earlier in this chapter, a commodity seller should be acquainted with all of their alternatives and understand when a specific strategy should be employed or revised. Remember, a strategy that worked effectively for one commodity sale may not be the best for your next commodity sale. The first four strategies discussed are usually used in advance of the actual sale of commodities. The next strategy (#5) can be used after the sale of the commodity.

Strategy #5: Sell Cash Crop and Buy Calls

Benefit from a Price Increase

Another strategy that can be used by a commodity seller is to buy a call option after you sell the cash commodity. This strategy would enhance your effective selling price if the market rallies after the cash market sale has been completed.

If you're like most farmers, you've probably asked yourself on more than one occasion this question:

"Should I sell my crop now or store and hope prices go up by spring?"

If you sell at harvest you receive immediate cash for your crop – money that can be used to pay off loans or reduce interest expenses. It also eliminates the physical risk of storing crops, and ensures you won't get into a situation where an increase in price still doesn't cover storage expenses. Therefore, one of the primary comparisons to consider when deciding to store grain or purchase a call option is the cost of storage versus the cost (premium paid) of the call.

Let's assume you are a corn producer. It is now October and the March futures price is quoted at $6.30 a bushel. At the time, the Mar $6.30 Corn call option is trading at 10 cents per bushel.

Action

You sell your corn at harvest. After reviewing the premiums for the various call options, you decide to buy one at-the-money March call option for every 5,000 bushels of corn you sell at the elevator.

Results

If prices decline, your maximum cost, no matter how steep the futures price decline, will be 10 cents per bushel – the premium paid for the call.

If the March futures price increases anytime before expiration, you can sell back the call for its current premium, and your net profit is the difference between the premium you paid for buying the March call and the premium received for selling (offsetting) the March call.

Depending upon the March futures price, the table below shows your profit or loss if you had bought a March $6.30 call at a premium of 10 cents. Assume there is no remaining time value left in the option.

If Mar Corn futures price in February is:	Long call net gain or loss
$6.00	.10 loss
$6.10	.10 loss
$6.20	.10 loss
$6.30	.10 loss
$6.40	0
$6.50	.10 gain
$6.60	.20 gain
$6.70	.30 gain

One of the greatest benefits of this strategy is the flexibility it provides to producers. They don't have to feel locked in to a given harvest price or take on additional storage costs with no guarantee that prices are going up and their grain won't suffer some physical damage. Of course, there is a price for this flexibility – the option premium. And option premiums will vary, depending on what option strike price you buy. Your options are open.

QUIZ 13

1 **Assume it is now November, that the Jul Corn futures price is $6.70, and that call options with various strike prices are currently being traded at the following premiums:**

Call option strike price	Call option premium
$6.50	$.23
$6.60	$.19
$6.70	$.15
$6.80	$.09

Based on the futures price at expiration and the call you have purchased, determine the net profit or loss.

If futures price at expiration is:	Net profit or loss at expiration if you bought			
	$6.50 call	$6.60 call	$6.70 call	$6.80 call
$6.50	_____	_____	_____	_____
$6.80	_____	_____	_____	_____
$7.10	_____	_____	_____	_____

2. **Based on your answers to Question 1, which option offers the greatest profit potential?**

(a) July $6.50 call

(b) July $6.60 call

(c) July $6.70 call

(d) July $6.80 call

3. **Based on your answers to Question 1, which option involves the largest possible loss?**

(a) July $6.50 call

(b) July $6.60 call

(c) July $6.70 call

(d) July $6.80 call

4. **Assume at harvest you sold your corn at $6.60 per bushel and purchased a $6.80 July call option for 9 cents. What will be the effective selling price if: (Note: Assume it is close to option expiration so there is no remaining time value.)**

Futures price is:	Effective sale price:
$6.50	$_____per bu
$6.80	$_____per bu
$7.10	$_____per bu

See the answer guide at the back of this book.

Strategy Summary

Flexibility and Diversity

The strategies described up to now have hopefully served two purposes: to illustrate the diversity of ways in which agricultural futures and options can be used and to increase your "comfort level" with the math of futures and options. By no means, however, have we included – or attempted to include – all of the possible strategies.

Neither have we fully discussed the "ongoing flexibility" enjoyed by buyers and sellers of futures and options. The existence of a continuous two-sided market means that futures and options initially bought can be quickly sold, and futures and options initially sold can be quickly liquidated by an offsetting purchase. This provides the opportunity to rapidly respond to changing circumstances or objectives.

For example, let's say you paid 1.4 cents per pound for an at-the-money Soybean Oil put option with a strike price of 53 cents and, after several months, the underlying futures price declines to 48 cents. The put is now trading for 6 cents. By selling back the option at this price, you have a net return on the option of 4.6 cents ($.06 premium received – $.014 premium paid). This could be an attractive strategy if, at 48 cents, you feel the price decline has run its course and prices are likely to rise. Once the futures price rises above 53 cents the put no longer holds any intrinsic value.

Options in Combination with Other Positions

As you fine-tune your understanding of options, you may well discover potentially worthwhile ways to use puts and calls in combination with hedging or forward contracting, either simultaneously or at different times.

For instance, assume a local elevator offers what you consider an especially attractive price for delivery of your crop at harvest. You sign the forward contract, but you're a little uneasy about the delivery clause. If you are unable to make complete delivery of the agreed upon amount, the elevator charges a penalty for the undelivered bushels. To protect yourself, you buy enough call options to cover your delivery requirements. Then, if you are unable to make complete delivery on the forward contract due to reduced yields and if the calls increased in value, you could offset some or all of your penalty charges.

For example, suppose a producer has entered into a forward contract to deliver 10,000 bushels of corn at $5.20 in November. December futures are currently trading at $5.40. He simultaneously buys two Dec $5.60 Corn calls (out-of-the-money) at 10 cents per bushel. A floor price for the crop has been established at $5.10 ($5.20 forward contract – $.10 premium paid).

Suppose it was a long, dry, hot summer, and production fell short of expectations. If these fundamentals caused futures prices to go beyond $5.70, (i.e., the strike price plus the $.10 paid for the option), the farmer could sell back the calls at a profit. The producer could then use this money to offset some of the penalty charges he might incur if he doesn't meet the delivery requirements of the forward contract.

Other Option Alternatives

In addition to the standard options on the Grain and Oilseed futures contracts, CME Group offers an array of shorter term options that offer flexibility to more precisely tailor your hedging strategies to a specific time period or around specific events. Because their time to expiration is shorter than for a standard option, their premiums are typically lower too.

Serial. Serial options are like standard options, but they are listed in months where no underlying futures or standard options are listed. For example, Corn futures are listed in December, March, May, July and September, as are standard Corn options. That means that Corn serial options are listed in January, February, April, June, August, October and November. Serial options normally trade for approximately 90 days and can be used for short term hedging, or to extend a hedge from one month to another. The underlying futures for a serial option is the first contract following the serial option month.

Short-Dated New Crop Options. Short-Dated New Crop options provide a shorter term alternative for trading new crop corn, soybeans and wheat. These options reference the new crop month, but expire earlier than the traditional (standard) new crop options. With their reduced time values and earlier expirations compared to standard new crop options, they allow you to manage risk during key events (such as USDA reports) or specific windows of the growing season, at lower premiums. Learn more at **www.cmegroup.com/sdnc**.

Weekly Grain Options. Weekly Grain options are very short duration options – up to 28 days – on the benchmark grain and oilseed futures: Corn, Wheat, Soybeans, Soybean Meal and Soybean Oil. With an expiration occurring every Friday that is not an expiration of either a standard or serial option, Weekly Grain options allow management of event driven exposure and targeted trading around specific time periods for a relatively lower premium. Learn more at **www.cmegroup.com/weeklyags**.

Calendar Spread Options. Calendar Spread Options (CSOs) are options on the price differential between two delivery months of the same futures contract. Featuring smaller strike price intervals than standard options, CSOs allow more precise hedging of calendar spread risk in Corn, Wheat, Soybeans, Soybean Oil and Soybean Meal futures. Since CSOs are sensitive only to the value and volatility of the spread itself, rather than the underlying commodity, they offer more efficient protection against adverse movements in calendar spreads while providing access to favorable spread changes. Learn more at **www.cmegroup.com/gso**.

CONCLUSION: OTHER CONSIDERATIONS

Additional Risks of the Grain Hedger

This guide focused on how participants in the grain and oilseed markets can manage the price risks associated with buying and selling. There are many other risks that a grain operation is exposed to, and the same concepts of managing grain risk can also be applied to other price risks that these operations may face.

Nearly every grain business consumes energy, which could have a major impact on a firm's bottom line. At times, the energy markets may be quite volatile. Regardless of the types of energy consumed--gasoline, natural gas, heating oil, diesel fuel, crude oil or others--CME Group has a variety of Energy futures and options products available to help manage these risks.

Depending on the size of the grain related business, the financial portfolio or the ability to borrow to fund operations may be at risk to changing interest rates. Whether the hedger has short or long term interest rate exposure, the CME Group financial products, such as Eurodollars and U.S. Treasury futures and options, can help minimize the risks of fluctuating interest rates.

If a business is buying or selling grains and oilseeds outside their own borders, fluctuating foreign currency values (i.e., FX risk) may also have an impact on the firm's bottom line. CME Group FX products can help manage these market exposures, including Mexican Peso, British Pound, Canadian Dollar, Japanese Yen, Chinese Renminbi, Euro Currency, Australian Dollar and many others.

A commodity broker or advisor will be able to advise grain hedgers on structuring strategies to address the various risks they face.

Transaction Costs

Trading futures and options involves various transaction costs, such as brokerage commissions and possible interest charges related to performance bond/margin money. The strategies in this book do not include transaction fees. However, in reality, these costs should be included when evaluating futures and options strategies as they will effectively lower the commodity selling price or increase the commodity buying price. Check with your commodity broker for more information on commodity transaction costs.

Tax Treatment

With all futures and options strategies, you may want to check with your tax accountant regarding reporting requirements. The tax treatment may vary depending on the type of strategy implemented, the amount of time you hold the position, and whether the position is considered a hedge or speculative strategy.

Finding a Broker

Establish a relationship with a broker who is knowledgeable about agricultural futures, options, and price risk management. A broker can answer questions you will inevitably have, keep you posted on new developments, and alert you to specific opportunities that may be worth your consideration. For a list of brokers that execute trades in CME Group products, visit **www.cmegroup.com/findabroker**.

Summary

If you feel you have a working understanding of the material covered in this course – or even a major portion of it – consider yourself far better informed than all but a small percentage of your competitors. And, with the ever-increasing emphasis on marketing skills, it is an advantage that can open the door to new profit opportunities. This does not mean, however, that you should rush immediately to the phone to begin placing orders to buy or sell futures or options. Review and, from time to time, review again – the portions of this course having to do with market nomenclature and mechanics. Eventually, it will become second nature to you to calculate the possible outcomes of any given strategy and to compare that strategy with alternative price risk management strategies.

Seek additional information. Whenever available, send for copies of booklets and other publications on options from such sources as futures exchanges, brokerage firms, and extension-marketing specialists. Watch for opportunities to attend worthwhile seminars on futures and options.

Granted, honing your options skills will require an investment of time and effort, but there is a good chance it may be one of the best investments you will ever make. Besides, by completing this self-study guide, you have already begun to make an investment!

CME GROUP AGRICULTURAL MARKETS

Prices of these primary products are subject to factors that are difficult or impossible to control, such as weather, disease and political decisions. In addition, there are also short-term fixed-supply products offered in a context of growing worldwide demand and global economic expansion. As such, CME Group Agricultural markets serve commodity producers and users seeking price risk management and pricing tools, alongside funds and other traders looking to capitalize on the extraordinary opportunities these markets offer.

CME Group offers the widest range of agricultural markets in the world, with trading available on the following products:

Grains and Oilseeds
Commodity Indexes
Dairy Products
Livestock
Forest Products
Soft Commodities

In addition, CME Group offers central counterparty clearing services for over-the-counter (OTC) Agricultural products submitted for clearing through CME ClearPort. Learn more at **cmegroup.com/agswaps**.

For more information, visit **cmegroup.com/agriculture**.

GLOSSARY

at-the-money option – An option whose strike price is equal or approximately equal to the current market price of the underlying futures contract.

basis – The difference between the local cash price of a commodity and the price of a related futures contract, i.e., cash price – futures price = basis.

bearish – A market view that anticipates lower prices.

break-even point – The futures price at which a given option strategy is neither profitable nor unprofitable. For long call option strategies, it is the strike price plus the premium. For long put option strategies, it is the strike price minus the premium.

bullish – A market view that anticipates higher prices.

call option – An option that gives the option buyer the right to purchase (go "long") the underlying futures contract at the strike price on or before the expiration date.

CFTC – Commodity Futures Trading Commission.

closing transaction – See *liquidation*.

commission – Fees paid to the broker for execution of an order.

exercise – The action taken by the holder (buyer) of a call if he wishes to purchase the underlying futures contract or by the holder (buyer) of a put if he wishes to sell the underlying futures contract.

exercise price – Same as *strike price*.

expiration date – The last date on which the option may be exercised. Although options expire on a specified date during the calendar month prior to the contract month, an option on a November futures contract is referred to as a November option, since its exercise would lead to the creation of a November futures position.

expire – When option rights are no longer valid after the option's expiration date.

extrinsic value – Same as *time value*.

futures contract – A standardized contract traded on a futures exchange for the delivery of a specified commodity at a future time. The contract specifies the item to be delivered and the terms and conditions of delivery.

futures price – The price of a futures contract determined by open competition between buyers and sellers on the trading floor of a commodity exchange or through the exchange's electronic trading platform.

hedge – The buying or selling of futures contracts and/or options contracts for protection against the possibility of a price change in the physical commodity.

holder – Same as *option buyer*.

in-the-money option – An option that has intrinsic value, i.e., when a call strike price is below the current underlying futures price or when a put strike price is above the current underlying futures price.

intrinsic value – The dollar amount that would be realized if the option were to be exercised immediately. See *in-the-money option*.

liquidation – A purchase or sale that offsets an existing position. This may be done by selling a futures or option that was previously purchased or by buying back a futures or option that was previously sold.

long – A position established by purchasing a futures contract or an options contract (either a call or a put).

long hedge – Buying a futures contract(s) and/or using an option contract(s) to protect the price of a physical commodity one is planning to buy.

margin – See *performance bond/margin*.

margin call – A requirement made by a brokerage firm to a market participant to deposit additional funds into one's performance bond/margin account to bring it up to the required level. The reason for additional funds can be the result of a losing market position or an increase in the exchange performance bond/margin requirement.

offset – Taking a futures or option position equal and opposite to the initial or opening position of an identical futures or option contract; closes out or liquidates an initial futures or options position.

opening transaction – A purchase or sale that establishes a new position.

open interest – Total number of futures or options (puts and calls) contracts traded that have not been closed out or liquidated an offset on delivery.

option buyer – The purchaser of either a call option or a put option; also known as the option holder. Option buyers receive the right, but not the obligation, to enter a futures market position.

option seller – The seller of a call or put option; also known as the option writer or grantor. An option seller receives the premium and is subject to a potential market obligation if the option buyer chooses to exercise the option rights.

out-of-the-money option – A put or call option that currently has zero intrinsic value. That is, a call whose strike price is above the current futures price or a put whose strike price is below the current futures price.

performance bond/margin – In commodities, an amount of money deposited to ensure fulfillment of a futures contract at a future date. Option buyers do not post margin – also called performance bond – since their risk is limited to the option premium, which is paid in cash when the option is purchased. Option sellers are required to post performance bond/margin to ensure fulfillment of the options rights.

premium – The price of a particular option contract determined by trading between buyers and sellers. The premium is the maximum amount of potential loss for an option buyer and the maximum amount of potential gain for an option seller.

put option – An option that gives the option buyer the right to sell (go "short") the underlying futures contract at the strike price on or before the expiration date.

serial option – Short-term option contracts that trade for approximately 60 days and expire during those months in which there is not a standard option contract expiring. These options are listed for trading only on the nearby futures contract, unlike standard options, which can be listed for nearby and deferred contract months.

short – The position created by the sale of a futures contract or option (either a call or a put).

short hedge – Selling a futures contract(s) and/or using options to protect the price of a physical commodity one is planning to sell.

speculator – A market participant who buys and sells futures and/or options in hopes of making a profit – adding liquidity to the market.

standard option – Traditional option contracts trading in those months which are the same as the underlying futures contract. Standard option contracts can be listed for nearby and deferred contract months.

strike price – The price at which the holder of a call (put) may choose to exercise his right to purchase (sell) the underlying futures contract.

time value – The amount by which an option's premium exceeds the option's intrinsic value. If an option has zero intrinsic value, its premium is entirely time value.

transaction cost – Fees charged by brokers including exchange and clearing fees to buy or sell futures and options contracts.

underlying futures contract – The specific futures contract that may be bought or sold via the exercise of an option.

writer – See *option seller.*

ANSWER GUIDE

Quiz 1

1. **(b)** Futures contracts are standardized as to quantity, quality, delivery time and place. Price is the only variable. In contrast, the terms of a forward contract are privately negotiated.
2. **(a)** All futures prices are discovered through competition between buyers and sellers of a given commodity. Neither the Exchange nor CME Clearing participates in the process of price discovery.
3. **(e)** CME Clearing performs both of these functions. CME Clearing ensures the integrity of futures and options contracts traded at the CME Group and clears every trade made at the CME Group.
4. **(b)** At the end of each trading session, CME Clearing determines net gains or losses for each member firm, and each member firm does the same with its customers' accounts.
5. **(e)** Speculators perform all of these functions.
6. **(a)** A true hedge involves holding opposite positions in the cash and futures markets. The other positions are merely forms of speculation, since they cannot offset losses in one market with gains in another.
7. **(d)** Futures margins act as performance bonds that provide proof of an individual's financial integrity and one's ability to withstand a loss in the event of an unfavorable price change. They do not involve credit or down payments, as securities margins do.
8. **(f)** Being long in a falling market (b) or short in a rising market (c) would result in a loss and, therefore, could lead to a margin call. Because situations (a) and (d) are both profitable, there would not be a margin call.
9. **(c)** Customer margin requirements are set by each brokerage firm, while clearing margin requirements for clearing member firms are set by CME Clearing. Neither the Federal Reserve Board nor the Commodity Futures Trading Commission is involved with setting margins.
10. **(a)** A customer can withdraw gains as soon as they are credited to the account, provided they are not required to cover losses on other futures positions. Accounts are settled after the markets close, so funds are usually available by the start of the next business day.

Quiz 2

1. **(c)** Cash prices and futures prices generally move upward and downward together but not necessarily by identical amounts. Even so, the changes are usually close enough to make hedging possible by taking opposite positions in the cash and futures markets.
2. **(a)** Protection against rising prices is accomplished by taking a long futures position — i.e., by purchasing futures contracts. Protection against declining prices can be achieved by selling futures contracts.
3. **(a)** The farmer is in the same position, in terms of market exposure, as someone who has purchased and is storing the crop; benefiting if prices increase and losing if prices decrease.
4. **(c)** The basis is the amount by which the local cash price is below (or above) a particular futures price. The difference between futures prices for different delivery months is known as the carrying charge or the spread.
5. **(d)** Credit yourself a bonus point if your sharp eye caught this tricky question. The question asks what buying price you can lock in by selling a futures contract. Buying prices are locked in by buying futures contracts.
6. **(c)** The approximate selling price you can lock in by selling a futures contract is $5.35, the price of the futures contract you sold minus the local basis of 15 under ($5.50 – $.15).
7. **(a)** Transportation costs due to location differences are one of the components of the basis; thus higher transportation costs would, all else remaining the same, weaken the basis.
8. **(d)** An unhedged long cash market position is a speculative position — you will realize a gain if prices increase or a loss if prices decrease.
9. **(b)** When the basis is relatively weak. For example, assume you initially hedged by purchasing a wheat futures contract at $6.50. If, down the road, prices rise and your supplier is quoting you $7.00 and the futures price is $6.80 (a basis of $.20 over), your net purchase price when you lift the hedge is $6.70 ($7.00 supplier's cash price – $.30 gain on futures). On the other hand, let's say futures prices still increased to $6.80 but your supplier is quoting you $6.90 (a weaker basis of $.10 over). Under this scenario your net purchase price is only $6.60 ($6.90 supplier's cash price – $.30 gain on futures).

10. (a) If you could predict the basis exactly, you would know exactly what net price a given hedge would produce. To the extent basis is subject to fluctuation, there is a "basis risk."

11. (a) Provided you like the quoted price for soybean oil, it would make "sense" to hedge your price risk by purchasing Soybean Oil futures. According to your basis records, the quoted February basis of 5 cents over March futures is historically strong. Since you would benefit from a weakening basis you could take advantage of today's futures prices by hedging, wait for the basis to weaken, then offset your futures position by selling Soybean Oil futures and simultaneously purchase Soybean Oil from one of your suppliers.

12. (b) $6.50 futures price + $.12 expected basis = $6.62 expected purchase price. Of course, if the basis is stronger than 12 cents over, your actual purchase price will be higher than expected. And, if the basis is weaker than 12 cents over, your actual purchase price will be lower than expected. The important point to remember is hedging with futures allows you to "lock in" a price level, but you are still subject to a change in basis.

Quiz 3

1.

May futures price	Net purchase price	Explanation	
$5.58	$5.70	$5.58	futures price
		– .05	basis
		$5.53	cash purchase price
		+ .17	futures loss (buy $5.75 – sell $5.58)
		$5.70	net purchase price
$5.84	$5.70	$5.84	futures price
		– .05	basis
		$5.79	cash purchase price
		– .09	futures gain (buy $5.75 – sell $5.84)
		$5.70	net purchase price
$5.92	$5.70	$5.92	futures price
		–.05	basis
		$5.87	cash purchase price
		–.17	futures gain (buy $5.75 – sell $5.92)
		$5.70	net purchase price

2. In April, the price of corn from your supplier is $5.87 ($5.80 futures + $.07 basis). The gain on the futures position is 5 cents per bushel ($5.80 sold futures – $5.75 bought futures), which is used to lower the net purchase price to $5.82 ($5.87 cash price – $.05 futures gain).

Quiz 4

1.

Cash market Jul	Futures market	Basis
Elevator price for soybeans delivered in Oct. at $12.30/bu	Sell Soybean futures at $12.55/bu	–.25
Futures price	**Expected basis**	**Expected selling price**
$12.55/bu	–$.20/bu	$12.35/bu

2.

Cash market Jul	Futures market	Basis
Elevator price for soybeans delivered in Oct. at $12.30/bu	Sell Soybean futures at $12.55/bu	–.25
Oct		
Elevator price for soybeans at $11.90/bu	Buy Soybean futures at $12.10/bu	–.20
	$.45 gain	+.05 change

Result:

elevator sale price	$11.90/bu
gain on futures position	+$.45/bu
net sales price	$12.35/bu

If you had not hedged, you would have received only $11.90 per bushel for your crop versus $12.35. By hedging, you were protected from the drop in prices but also gained 5 cents from an improvement in the basis.

Quiz 5

1. 50 cents	**2.** 0	**3.** 50 cents	**4.** 0
5. 0	**6.** 40 cents	**7.** 25 cents	**8.** 0

Quiz 6

1. 5 cents	**2.** 0	**3.** 0	**4.** 10 cents
5. 8 cents	**6.** at-the-money	**7.** more	**8.** increases

Quiz 7

1. **(d)** The buyer of an option can exercise the option, sell the option to someone else, or allow the option to expire.
2. **(b)** Upon exercise, the seller of a call acquires a short futures position.
3. **(a)** Only the seller of an option is required to deposit and maintain funds in a margin account. The option buyer has no such requirement.
4. **(b)** Option premiums are arrived at through competition between buyers and sellers through the exchange's electronic trading platform.
5. **(c)** An option's premium is the total of its intrinsic value (if any) plus its time value (if any).
6. **(a)** An option's value is influenced most by time and volatility.
7. **(a)** With the soybean futures price at $12.25, a $12.00 call selling for 27 cents would have an intrinsic value of 25 cents and a time value of 2 cents.
8. **(c)** If the futures price at expiration is $11.50, a call conveying the right to purchase the futures contract at $12.00 would be worthless.
9. **(a)** The most that any option buyer can lose is the premium paid for the option. Your maximum loss would thus be 10 cents per bushel.
10. **(c)** Your potential loss is unlimited because you must honor the call option if it is exercised.
11. **(b)** With the underlying wheat futures price at $6.50, a call with a strike price of $6.00 would be in the money by 50 cents.

Quiz 8

1.

January futures price	Net price		Explanation
$12.20	$12.53	$12.20	futures price
		+ .20	basis
		+ .13	premium
		– .00	intrinsic value at expiration
		$12.53	net purchase price
$12.80	$12.73	$12.80	futures price
		+ .20	basis
		+ .13	premium
		– .40	intrinsic value at offset
		$12.73	net purchase price
$13.40	$12.73	$13.40	futures price
		+ .20	basis
		+ .13	premium
		– 1.00	intrinsic value at offset
		$12.73	net purchase price

2.

March futures price	Net price		Explanation
$5.80	$5.28	$5.80	futures price
		– .10	basis
		+ .08	premium
		– .50	intrinsic value at offset
		$5.28	net purchase price
$5.60	$5.28	$5.60	futures price
		– .10	basis
		+ .08	premium
		– .30	intrinsic value at offset
		$5.28	net purchase price
$5.20	$5.18	$5.20	futures price
		– .10	basis
		+ .08	premium
		+ .00	intrinsic value at expiration
		$5.18	net purchase price

Quiz 9

1. There is no ceiling price. By selling a put option you are protected only to the level of premium received.
   Floor price = put strike +/– basis – premium
   $.535/lb = $.55 – $.005 – $.01

2. Short put gain/loss = futures price – put strike price + premium received (maximum gain = premium received)

Futures price is:	Put gain/loss	
$.52	$.02 loss	$.52 – $.55 + $.01
$.53	$.01 loss	$.53 – $.55 + $.01
$.54	$.00	$.54 – $.55 + $.01
$.55	$.01 gain	futures price is greater than put strike price, so you keep entire premium
$.56	$.01 gain	futures price is greater than put strike price, so you keep entire premium
$.57	$.01 gain	futures price is greater than put strike price, so you keep entire premium

3. Purchase price was lower than expected because the basis weakened to 1 cent under October.

Futures price is:	–	Actual basis	=	Cash price	+/–	$.45 Put gain(+)/ loss(–)	=	Effective purchase price
$.52	–	$.01	=	$.51	+	$.02 (L)	=	$.53
$.53	–	$.01	=	$.52	+	$.02 (L)	=	$.53
$.54	–	$.01	=	$.53		$.00	=	$.53
$.55	–	$.01	=	$.54	–	$.01 (G)	=	$.53
$.56	–	$.01	=	$.55	–	$.01 (G)	=	$.54
$.57	–	$.01	=	$.56	–	$.01 (G)	=	$.55

Quiz 10

1. The soybean buyer is anticipating a local basis of 20 cents over the March futures price. Given this information, you can calculate the ceiling and floor prices.

   $11.80 floor price =
   $11.50 put strike price + $.15 call premium –
   $.05 put premium + $.20 expected basis

   $12.30 ceiling price
   $12.00 call strike price + $.15 call premium –
   $.05 put premium + $.20 expected basis

2. Long call gain/loss = futures price – call strike price – premium cost; maximum loss = premium paid

Futures price is:	Call gain/loss	
$11.00	$.15 loss	futures price is lower than call strike price, so the call has no value; the maximum cost was the 15-cent premium
$11.50	$.15 loss	futures price is lower than call strike price, so the call has no value; the maximum cost was the 15-cent premium
$12.00	$.15 loss	futures price is at the call strike price, so the call has 50 cents of intrinsic value; the out-of pocket cost was the 15-cent premium
$12.50	$.35 gain	futures price is greater than call strike price, so the call has intrinsic value; the maximum cost was the 15-cent premium
$13.00	$.85 gain	Futures price is greater than call strike price, so the call has $1.00 of intrinsic value; the maximum cost was the 15-cent premium.

3. Short put gain/loss = futures price – put strike price + premium received; maximum gain = premium received

Futures price is:	Put gain/loss	
$11.00	$.45 loss	Futures price is less than put strike price, so the short put position has a loss of 50 cents minus the 5 cents of premium initially collected
$11.50	$.05 gain	futures price equals put strike price, so you keep entire premium
$12.00	$.05 gain	futures price is higher than put strike price, so you keep entire premium
$12.50	$.05 gain	futures price is higher than put strike price, so you keep entire premium
$13.00	$.05 gain	futures price is higher than put strike price, so you keep entire premium

4. Since the actual basis was 20 cents over March, as expected, the purchase price range fell within $11.80 to $12.30 regardless of the futures price.

If March futures are:	+	Actual basis	=	Cash price	+/ –	$12.00 call gain(–)/loss(+)	+/ –	$11.50 put gain(–)/loss(+)	=	Effective purchase price
$11.00	+	$.20	=	$11.20	+	$.15 (L)	+	$.45 (L)	=	$11.80
$11.50	+	$.20	=	$11.70	+	$.15 (L)	–	$.05 (G)	=	$11.80
$12.00	+	$.20	=	$12.20	+	$.15 (L)	–	$.05 (G)	=	$12.30
$12.50	+	$.20	=	$12.70	–	$.35 (G)	–	$.05 (G)	=	$12.30
$13.00	+	$.20	=	$13.20	–	$.85 (G)	–	$.05 (G)	=	$12.30

Quiz 11

1. **November**

futures price	**Net return**	**Explanation**
$11.80	$11.95	$11.80 futures price – .25 basis – .30 premium + .70 intrinsic value of option $11.95 net return
$12.60	$12.05	$12.60 futures price – .25 basis – .30 premium + .00 intrinsic value of option $12.05 net return
$14.30	$13.75	$14.30 futures price – .25 basis – .30 premium + .00 intrinsic value of option $13.75 net return

2. **September**

futures price	**Net return**	**Explanation**
$6.40	$6.52	$6.40 futures price – .10 basis – .08 premium + .30 intrinsic value of option $6.52 net return
$6.70	$6.52	$6.70 futures price – .10 basis – .08 premium + .00 intrinsic value of option $6.52 net return
$7.00	$6.82	$7.00 futures price – .10 basis – .08 premium + .00 intrinsic value of option $6.82 net return

Quiz 12

1. As explained, the soybean producer is anticipating a harvest basis of 25 cents under the November futures price. Given this information, you can calculate the floor and ceiling prices.

   Put strike price – put premium + call premium +/– expected basis = floor price $10.00 – $.11 + $.12 – $.25 = $9.76

   Call strike price – put premium + call premium +/– expected basis = ceiling price $11.00 – $.11 + $.12 – $.25 = $10.76

2. Long put gain/loss = put strike price – futures price – premium paid

   Note: maximum loss = premium paid

Futures price is:	**Put gain/loss**	
$9.25	$.64 gain	$10.00 – $9.25 – $.11
$9.50	$.39 gain	$10.00 – $9.50 – $.11
$10.75	$.11 loss	futures price is greater than the put strike price, so the put has no value; the maximum expense is the 11-cent premium
$11.00	$.11 loss	futures price is higher than put strike price, so the put has no intrinsic value
$11.25	$.11 loss	futures price is higher than put strike price, so the put has no intrinsic value and the maximum cost is the 11-cent premium

3. Short call gain/loss = call strike price – futures price + premium received

   Note: maximum gain = premium received

Futures price is:	**Call gain/loss**	
$9.25	$.12 gain	futures price is lower than call strike price, so the call has no intrinsic value; you keep the entire premium
$9.50	$.12 gain	futures price is lower than call strike price, so the call has no intrinsic value; you keep the entire premium
$10.75	$.12 gain	futures price is lower than call strike price, so the call has no intrinsic value; you keep the entire premium
$11.00	$.12 gain	futures price equals the call strike price, so the call has no intrinsic value; you keep the entire premium
$11.25	$.13 loss	$11.00 – $11.25 + $.12

Quiz 13

4. Since the actual basis was 30 cents under November, 5 cents weaker than expected, the sale price range was 5 cents lower on both ends.

If Nov soybean futures are:	–	Actual basis	=	Cash price	+/–	Long $10.00 put gain(–)/loss(+)	+/–	Short $11.00 call gain(–)/loss(+)	=	Effective sale price
$9.25	–	$.30	=	$8.95	+	$.64 (G)	+	$.12 (G)	=	$9.71
$9.50	–	$.30	=	$9.20	+	$.39 (G)	+	$.12 (G)	=	$9.71
$10.75	–	$.30	=	$10.45	–	$.11 (L)	+	$.12 (G)	=	$10.46
$11.00	–	$.30	=	$10.70	–	$.11 (L)	+	$.12 (G)	=	$10.71
$11.25	–	$.30	=	$10.95	–	$.11 (L)	–	$.13 (L)	=	$10.71

1.

	Net profit or loss at expiration if you bought			
If futures price at expiration is:	$6.50 call	$6.60 call	$6.70 call	$6.80 call
$6.50 or below	loss $.23	loss $.19	loss $.15	loss $.09
$6.80	gain $.07	gain $.01	loss $.05	loss $.09
$7.10	gain $.37	gain $.31	gain $.25	gain $.21

The profit or loss is the option's intrinsic value (if any) at expiration less the premium paid for the option.

Thus, if the futures price at expiration is $7.10, the call with a $6.50 strike price would have a net profit of 37 cents.

$.60 intrinsic value at expiration
– $.23 initial premium
$.37 net profit

2. (a) If prices increase, the call with the lowest strike price will yield the largest profit. This is why individuals who are bullish about the price outlook may choose to buy an in-the-money call.

3. (a) Since the maximum risk in buying an option is limited to the option premium, the call with the highest premium involves the greatest risk.

4. Since the actual selling price was established at harvest, you would just add the gain or loss on the call to the harvest selling price.

Futures price is:	Harvest sale price	+/–	$6.80 call gain(+)/ loss(–)	=	Effective sale price
$6.50	$6.60	–	$.09 (L)	=	$.43
$6.80	$6.60	–	$.09 (L)	=	$.43
$7.10	$6.60	+	$.21 (G)	=	$.43

Corn, Chicago SRW Wheat, KC HRW Wheat, Soybean, Soybean Oil, Soybean Meal, Oat and Rough Rice futures and options are listed with and subject to the rules and regulations of the CBOT.

References to CME Clearing are to CME's U.S. Clearinghouse

Futures trading is not suitable for all investors, and involves the risk of loss. Futures are a leveraged investment, and because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money deposited for a futures position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles. And only a portion of those funds should be devoted to any one trade because they cannot expect to profit on every trade.

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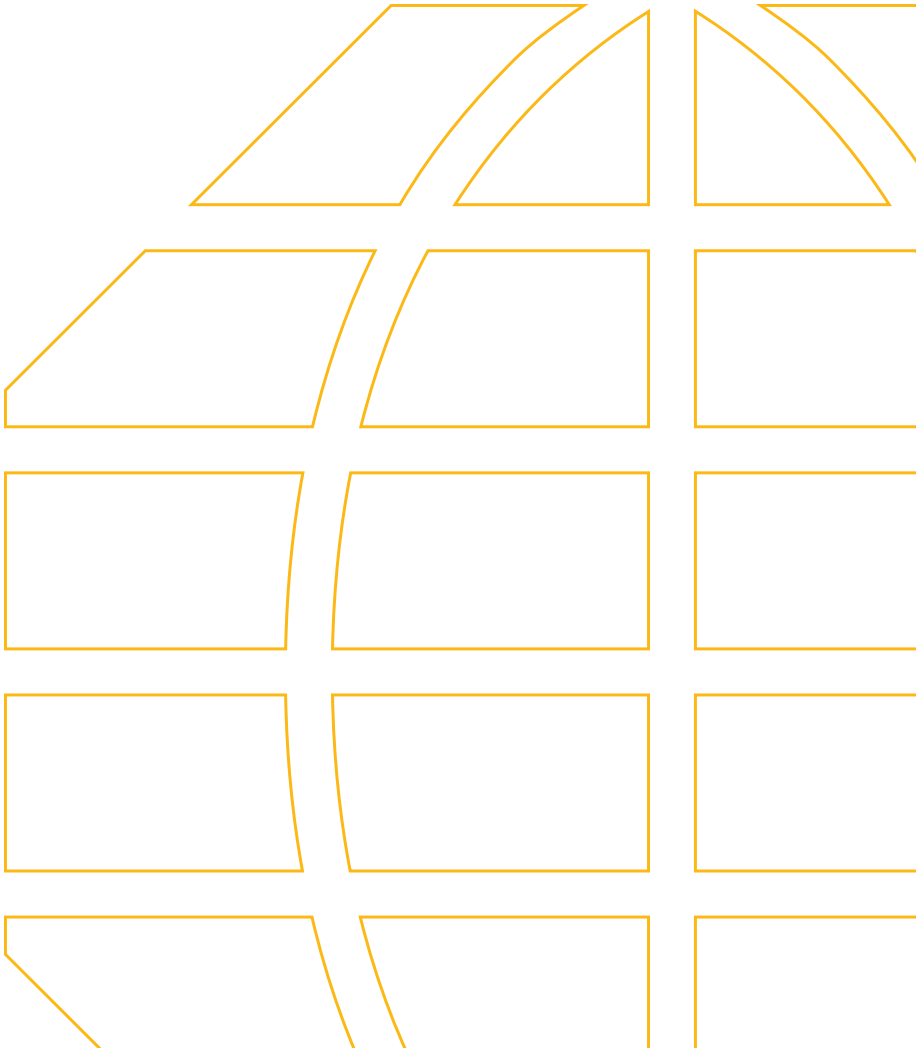
COMMODITY PRODUCTS

Managing Price Risk with Grain and Oilseed Futures and Options

All producers have market risk –
whether they realize it or not is another story.



Like most farmers, grain and oilseed producers tend to focus on production risk rather than market risk. Market risk includes two components: price and basis. Price levels are discovered via the CME Group futures market. Basis is the relationship between a local cash market price and the CME Group futures price (Cash Price – Futures Price = Basis at a specific point in time). A downturn in price and/or weakening basis can be just as financially devastating as a poor crop and, in some cases, even more so.

Unlike managing production risk, there are many alternatives available to manage market risk. This paper focuses on two common producer strategies using CME Group futures and options: short futures hedge and long put option hedge.

Short Futures Hedge

The short futures hedge is the most basic risk management strategy for grain and oilseed producers. A short position in CME Group futures is initiated as a temporary substitute for the eventual sale of the commodity to a local mill, elevator or cash merchant. The short futures position can be placed well in advance of harvest and will provide price protection until the cash crop is sold. Immediately upon the sale of the cash crop, the short futures position should be closed out (offset). Since prices in the cash market and futures market generally move up and down together over time, a loss in either of these markets will be offset by a gain in the other – thus allowing the producer to lock in a price level in advance of the cash sale.

Advantages

- Eliminates risk of lower price levels
- Establishes a selling price level in advance of cash crop sale
- Strengthening basis improves selling price
- Futures position guaranteed by CME Clearing

Disadvantages

- Weakening basis lowers selling price
- No benefit from higher price levels

Evaluation of a Short Futures Hedge

Short Futures Price	
+/- Expected Basis*	
Expected Selling Price	

*Basis at time of cash market sale

Short Futures Hedge Example: Assumptions

Sell December Corn futures:	$5.50/bu
Expected basis for November:	-0.30/bu
Expected selling price:	$5.20/bu

November Scenario 1: Falling Prices

Buy (offset) December futures	$4.00/bu
Basis	- .30
Local cash price	3.70
Futures profit[1]	+1.50
Actual selling price:	$5.20/bu

November Scenario 2: Rising Prices

Buy (offset) December futures	$6.50/bu
Basis	- .30
Local cash price	6.20
Futures loss[2]	-1.00
Actual selling price:	$5.20/bu

[1]Sold at $5.50/bu and bought at $4.00/bu
[2]Sold at $5.50/bu and bought at $6.50/bu

Strategy Notes

As prices moved lower in Scenario 1, the lower cash price was offset by a gain on the short futures position. Without the short futures hedge, the actual selling price would have been $3.70/bu. As prices moved higher in Scenario 2, the loss on the short futures position was offset by a higher cash-selling price. In both scenarios, the actual selling price was the same ($5.20/bu) because the basis did not change.

If basis had changed in the scenarios, the results would have been different. A stronger basis in November (e.g., -.20), would have resulted in a higher selling price of $5.30/bu, whereas a weaker basis in November (e.g., -.35) would have resulted in a lower selling price of $5.15/bu.

The short futures hedge locks in a selling price level in advance of the delivery date. Since basis movement affects the hedge outcome, a good understanding of your local basis and seasonality will be helpful in deciding if and when to use this strategy. Also, when evaluating futures or options strategies, you should include the transaction costs.

Long Put Option Hedge

With the advent of commodity options in 1984, a whole new world of risk management strategies opened for agribusinesses, including the grain and oilseed producer. The long put option position gives the producer the right (but not the obligation) to sell CME Group futures at a specific price level (strike price). If prices fall below this level, the producer (buyer of the put option) has the right to sell the underlying grain or oilseed futures at the strike price level. Should prices rally above the strike price level, the producer is not obligated to the put option strike price, and therefore, can sell their commodity production at the higher market price.

The long put position eliminates downside price level risk while allowing the producer to sell at a better price level if the markets move higher. In addition to the price level, the basis level will affect the actual selling price at the time of the cash sale, just as it did with the short futures hedge. A stronger basis at the time of the cash sale improves the selling price while a weaker basis will lower the actual selling price.

Evaluation

	Put Strike
-	Premium
+/-	Expected Basis*
	Expected Minimum (Floor) Selling Price

*Basis at time of cash market sale

Long Put Option Hedge Example

Buy 5.50 December Corn put option for $0.35/bu (premium)
Expected basis for early September: -0.30 bu
Expected minimum (floor) selling price: $5.50 - .35 - .30 = $4.85/bu

November Scenario 1: Falling Prices

December futures	$4.00/bu
Basis	- .30
Local cash price	3.70
5.50 Dec put option premium	$1.50
Put option profit[3]	+1.15
Actual selling price:	$4.85/bu

November Scenario 2: Rising Prices

December futures	$6.50/bu
Basis	- .30
Local cash price	6.20
5.50 Dec put option premium	$0.00
Put option loss[4]	- .35
Actual selling price:	$5.85/bu

[3]Buy put at $0.35/bu and sell (offset) put at $1.50/bu
[4]Buy put at $0.35/bu and put expires worthless

Advantages

- Eliminates risk of lower price level
- Establishes a minimum (floor) selling price level
- Benefits from a higher price level
- Strengthening basis improves selling price
- No margin requirements (put option buyers do not post margin)
- Option position guaranteed by CME Clearing (put option seller posts margin)

Disadvantages

- Weakening basis lowers selling price
- Premium is paid in full at time of put option purchase
- Transaction costs

Strategy Notes

As prices declined in Scenario 1, the lower cash market price was offset by a profit on the long put option position and the minimum (floor) selling price was achieved. If prices moved even lower, the option profit would have been greater, providing additional protection against the lower cash market price. However low the markets declined, the minimum selling price would be achieved. As prices rallied in Scenario 2, the put option loses value but the cash selling price increases. Although the cash selling price will continue to improve as price levels increase, the put option loss is limited to the initial premium paid. Therefore, the actual selling price continues to improve as prices move higher. Basis will have the same impact on the long put option hedge as it did with the short futures hedge.

The long put option hedge establishes a minimum (floor) selling price level and retains upside potential. This strategy is very similar to insurance in that it provides protection for a cost (premium). As with all types of insurance, the insured is protected if the risk occurs (in this case, lower prices), but they are actually better off if the risk does not occur and they don't have to rely on the coverage (in this case, higher prices).

Summary

The short futures hedge and the long put option hedge are only two of the many risk management alternatives available by using CME Group Grain and Oilseed futures and options. The flexibility of futures and options allows producers to adjust their market risk exposure to any level with which they are comfortable.

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CME Group

AGRICULTURAL PRODUCTS

Self-Study Guide to Hedging with Livestock Futures and Options

TABLE OF CONTENTS

In a world of increasing volatility, CME Group is where the world comes to manage risk across all major asset classes – agricultural commodities, interest rates, equity indexes, foreign exchange, energy and metals, as well as alternative investments such as weather and real estate. Built on the heritage of CME, CBOT, KCBT and NYMEX, CME Group is the world's largest and most diverse derivatives exchange encompassing the widest range of benchmark products available, providing the tools customers need to meet business objectives and achieve financial goals. CME Group brings buyers and sellers together on the CME Globex electronic trading platform. CME Group also operates CME Clearing, one of the world's leading central counterparty clearing providers, which offers clearing and settlement services across asset classes for exchange-traded contracts and over-the-counter derivatives transactions. These products and services ensure that businesses everywhere can substantially mitigate counterparty credit risk.

AGRICULTURAL PRODUCTS

MORE AGRICULTURAL FUTURES AND OPTIONS. GREATER OPPORTUNITY.

CME Group offers the widest range of agricultural derivatives of any exchange, with trading available on a variety of grains, oilseeds, livestock, dairy, lumber and other products. Representing the staples of everyday life, these products offer liquidity, transparent pricing and extraordinary opportunities in a regulated centralized marketplace with equal access for all participants.

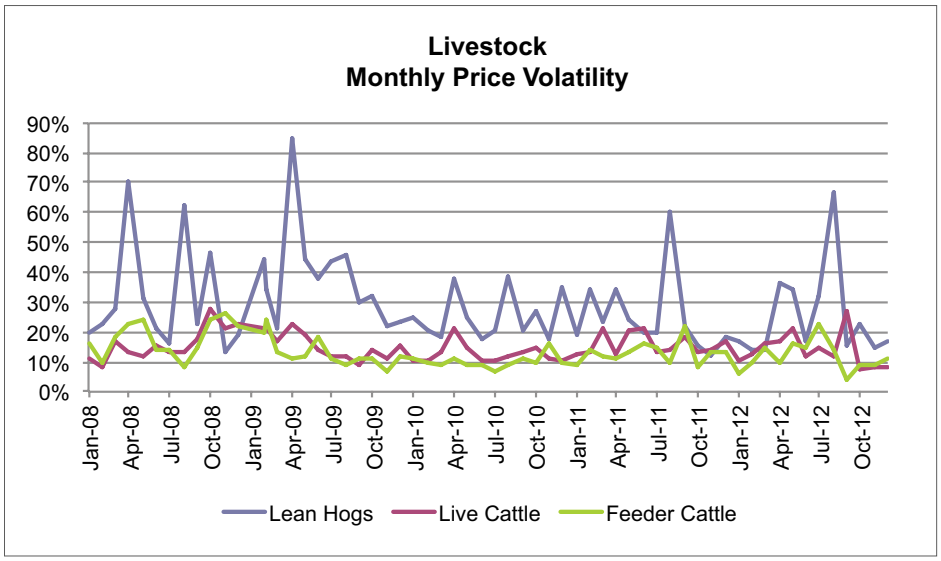
INTRODUCTION TO THE GUIDE

The agricultural commodity markets have experienced increased volatility in recent years. As part of this market trend, livestock buyers and sellers are facing an ever-increasing level of price risk. Doing nothing to manage price risk is tantamount to speculating in the physical (or "cash") markets, which can prove unhealthy to the bottom line of a livestock producer or commercial firm.

CME Group livestock futures and options provide livestock buyers and sellers with valuable tools to manage price risk and have more control over their bottom line. This guide is designed to provide a detailed overview of using futures and options for risk management in the livestock markets.

The early chapters will establish a foundation that the latter chapters will build on. For someone new to livestock price risk management, it may help to move sequentially through the chapters to get a basic understanding of the core concepts and fundamentals. Those with some experience may wish to proceed to the chapters with topics on which they may need a refresher, or perhaps would like a different perspective. Each chapter ends with a brief quiz which allows readers to test their grasp of the material.

Regardless of how the guide is used, the objective is to enhance the hedger's knowledge of using livestock futures and options to manage market risk.



Source: CME Group

CHAPTER 1

OVERVIEW OF THE LIVESTOCK FUTURES MARKET

What is a Livestock Futures Contract?

A Livestock futures contract is a legally binding agreement for a buyer to accept delivery and a seller to make delivery of:

- a *standardized* quantity and quality of a specified livestock product (live cattle, feeder cattle or lean hogs),
- during a *standardized* time period,
- to a *standardized* delivery point,
- for a price negotiated at the Chicago Mercantile Exchange (CME), on the CME Globex electronic trading platform.

Important Concepts of Livestock Futures

A futures contract is not a written document. Hedgers will get regular statements regarding their futures position from their brokers, but they will never receive a written contract. However, a futures contract is still *a legally binding agreement* that is just as enforceable as a written contract, to the full extent of the law.

Price is the only negotiable element of a futures contract. Futures contract prices are determined through the interaction between the buyer and the seller, representing demand and supply, respectively. The prices are *not* set by the CME. The CME simply provides the marketplace, futures products, technology, rules and regulations for the buyers and sellers to come together.

Although every futures contract involves a buyer (making bids) and a seller (making offers), neither party knows who is on the other side of the transaction. The buy or sell obligation is with the marketplace and not with an individual participant. A common misconception is that a speculator is always on the other side of a hedger's position, which is not accurate. A transaction could involve two hedgers, two speculators, or a hedger and a speculator.

Futures Terminology

The futures industry uses some terms that are very unique to this market, and some that are common to other markets. A few of the more important terms are described below; related terms are listed together for comparison and better understanding.

The **cash market** is also known as the physical or underlying market. These are specific market locations where the exchange of a physical product for payment takes place. As such, there are many cash markets located throughout the world. Hedgers may even have several cash markets near their location. Cash market prices may be different based on where they are located.

A **futures market** is a centralized market place that is often described as a "benchmark" market. Note that a futures market price is the same for buyers and sellers, regardless of the type of trader they are or where they are located.
A futures market price is determined through the interaction of the buyers (demand) and the sellers (supply).

A **bid** is an expression to buy and represents the demand for a product. Although a buying hedger would like to buy at the bid, in reality, they will usually buy at the offer, i.e., where someone is willing to sell.

An **offer** is an expression to sell and represents the supply of a product. Although a selling hedger would like to sell at the offer, in reality, they will usually sell at the bid, i.e., where someone is willing to buy.

A **tight bid/offer spread** occurs when the bids and offers are close together, and is a reflection of the market's efficiency and liquidity. Market efficiency and liquidity are important to a hedger when they are initiating and closing out their futures market positions.

A **long futures position** is an initial buy position that represents an obligation to accept delivery of the standardized commodity.

A **short futures position** is an initial sell position that represents an obligation to make delivery of the standardized commodity.

To **offset or close-out** an existing futures position is to simply take the opposite position in the same futures contract and delivery month.

- If initially long, offset by selling back the identical contract
- If initially short, offset by buying back the identical contract

Bear or bearish reflects lower or declining market prices and are directional terms often used to describe a trader, market movement, trend, strategy or opinion. A bearish strategy provides opportunity if the market moves lower.

Bull or bullish reflects higher or increasing prices and are also directional terms often used to describe a trader, market movement, trend, strategy or opinion. A bullish strategy provides opportunity if the market moves higher.

Volume is the number of futures contracts that are traded in a given time period. Although volume is quoted for different time periods, the most common is daily volume.

Open Interest is the number of contracts that have traded, but have not been closed out either through offset or delivery. Many market participants view open interest as a measure of the contract's liquidity or pricing efficiency.

A **Futures Commission Merchant (FCM)** is another term for a commodity broker. The only way to trade futures or options is through a broker or FCM.

Livestock Contract Specifications

A futures contract is designed with specifications to match cash market commodities and industry standards. The CME constantly monitors industry standards and cash market practices. If there are significant changes, the Exchange will consult with market participants to determine if modifications to the futures contract specifications are necessary.

The specifications help to ensure that there is a two-way relationship between the benchmark livestock futures market and the numerous livestock cash markets. The price that is discovered in a futures market comes from the interaction between the supply (sellers' offers) and demand (buyers' bids). Many of these bids and offers come from cash market participants. In turn, the futures contract price is then used by cash market participants to transact in the spot (current) market or for cash forward type contracts. Note that many cash market contracts are "based on" or "referenced to" the futures market price.

Physical Delivery versus Cash Settlement

Although many futures contracts are traded, very few will ever result in actual delivery of the physical commodity. The great majority of futures contracts are closed out, or "offset" prior to delivery by taking an opposite position in the same contract and delivery month. In other words, if someone initially buys a futures contract for a specific product and delivery month, and later sells a futures contract for the same product and delivery month, their position and market obligation is closed out. Conversely, if someone initially sells a futures contract and later buys back the same contract, the market obligation is closed out.

There are two types of settlement for futures contracts: physical delivery and cash-settlement.

- The Live Cattle futures contract requires physical delivery settlement in which live cattle are delivered. The CME Rulebook dictates the specific standards in terms of the quantity and quality (USDA Grades) of cattle that can be delivered. The seller of the Live Cattle futures contract makes the final decision regarding the actual quality and quantity that will ultimately be delivered, but it must be within the standards authorized by the Exchange. Any variations to the standardized quantity or quality may be subject to premiums or discounts to the futures price. The specific details of the physical delivery requirements specified in the CME Rulebook can be found at cmegroup.com/rulebook.
- The Feeder Cattle and Lean Hog futures contracts are cash (or "financially") settled contracts. All outstanding contracts that remain open after the last trading day will be automatically closed out at a price set equal to the CME Feeder Cattle Index or the CME Lean Hog Index on the last trading day. This final cash settlement cancels the obligation of the buyer and the seller. The specific details of the cash-settlement process are also specified in the CME Rulebook at cmegroup.com/rulebook.

The CME's Live Cattle futures contract requires delivery of live cattle during the contract month for all market participants who still have an open long position (obligations to accept physical delivery) or short position (obligation to make physical delivery) based on the latest Exchange rules and regulations.

The primary purpose of a futures contract is price risk management and not delivery of the actual or physical commodity on the futures contract. As such, it is usually more feasible in economic terms to deliver or accept delivery in a local cash market. Physical delivery on a Live Cattle futures contract is normally less than 1% of the total futures volume.

Then, why is there a physical delivery requirement on a futures contract? It is the possibility of physical delivery that causes the cash and the futures markets to converge at contract expiration. It also contributes to the necessary and vital market economic function known as price correlation, which keeps the cash and futures markets' prices moving in the same direction throughout the life of the futures contract.

As previously mentioned, the CME's Feeder Cattle and Lean Hog futures contracts have a cash settlement requirement. Although it is a different type of delivery system than Live Cattle, the objectives are the same: cash/futures convergence and correlation.

In the cash-settlement procedures, all long contracts still open after the last trading day are automatically offset against all remaining open short contracts. They are settled to a price equal to the CME Feeder Cattle Index or to the CME Lean Hog Index on that day (see insert).

FEEDER CATTLE AND LEAN HOG INDEXES

The CME Feeder Cattle Index and the CME Lean Hog Index are calculated by CME Group staff using United States Department of Agricultural (USDA) data. The data and the formula used to calculate the final cash settlement price are made available to the public and can be found at cmegroup.com/feedercattle and cmegroup.com/leanhogs, respectively. Additional details on the cash-settlement process for Lean Hogs and Feeder Cattle futures can be found in the CME Rulebook located at cmegroup.com/rulebook.

The following table indicates the key features of the CME Livestock futures contracts. This will facilitate understanding of the basics of each contract, allowing readers to follow the examples used in this Hedging Guide.

Highlights of CME Livestock Futures Contracts

	CME LIVE CATTLE	CME FEEDER CATTLE	CME LEAN HOGS
Contract Size	40,000 Pounds (lb.) = 400 hundredweight (cwt)	50,000 Pounds (lb.) = 500 cwt	40,000 Pounds (lb.) = 400 cwt
Price Unit	Cents per pound or Dollars and Cents per cwt	Cents per pound or Dollars and Cents per cwt	Cents per pound or Dollars and Cents per cwt
Tick (minimum price change)	$0.00025 per pound = $0.025 per cwt = $10/contract	$0.00025 per pound = $0.025 per cwt = $12.50/contract	$0.00025 per pound = $0.025 per cwt = $10/contract
Daily Price Limits	$0.03 above or below the previous day's settlement price	$0.03 above or below the previous day's settlement price	$0.03 above or below the previous day's settlement price
Delivery Type	Physical Delivery	Cash (financial)	Cash (financial)
Contract Months	Feb(G), Apr (J), Jun(M), Aug(Q), Oct(V), Dec (Z)	Jan (F), Mar(H), Apr(J), May(K), Aug(Q), Sep(U), Oct(V), Nov(X)	Feb(G), Apr(J), May(K), Jun(M), Jul(N), Aug(Q), Oct(V), Dec(Z)
Ticker Symbol CME Globex	LE	GF	HE
Trading Hours CME Globex	Monday: 9:05 a.m. to 4:00 p.m. Central Time Tuesday – Thursday: 8:00 a.m. to 4:00 p.m. Central Time Friday: 8:00 a.m. to 1:55 p.m. Central Time		

For additional livestock futures contract specifications visit **cmegroup.com/agriculture**.

Participants

All futures markets participants can be classified in one of two ways, depending on their objectives of either managing price risk, or assuming price risk.

A **hedger** is an individual or firm that uses the futures market to manage or reduce the price risk associated with their cash market position. A livestock hedger eventually buys or sells the physical livestock product or by-product in the cash market. Hedgers will choose the futures contract that matches their underlying physical market commodity.

Sometimes there are physical livestock products that do not have a corresponding futures contract that directly matches the underlying market. As such, a *cross-hedge strategy* can be employed, using a CME Livestock futures contract to manage the price risk of a different, but related, livestock/meat product which is not traded in the futures market. To ensure the efficiency of a cross-hedge, there must be a strong correlation between the futures price and the cash price of the different livestock/meat product.

The other type of futures industry participant is the **speculator**, an individual or firm that assumes price risk by buying or selling livestock futures in an attempt to profit from a potential change in price or price relationship. The futures market speculator usually does not hold or plan to acquire the cash product.

Speculators provide a major benefit to hedgers and the marketplace alike – market liquidity. *Market liquidity* is a measure of the market's efficiency, and it is this efficiency that results in better bids and offers for all market participants, including the hedger. Liquidity is also key to the ability to initiate and offset futures positions.

Platforms

CME Globex is the premier global electronic platform for trading livestock futures and options as well as other products at CME Group exchanges.

CHAPTER 1 QUIZ

1. In which market does a livestock hedger usually deliver or accept delivery of the physical livestock?

    a. Futures market

    b. Option market

    c. Swap market

    d. Local cash market

2. What happens to the obligations of most futures contracts used in a hedge?

    a. They expire worthless

    b. They are physically delivered

    c. They are closed-out by an offsetting transaction

    d. They are converted into a swap contract

3. Which of the following is the only variable element of a standardized livestock futures contracts?

    a. Quantity

    b. Quality

    c. Time of delivery

    d. Place of delivery

    e. Price

4. If you are long a CME livestock futures contract:

    a. You have an obligation to accept delivery

    b. You have an obligation to make delivery

    c. You have the right but not an obligation to accept delivery

    d. You have the right but not an obligation to make delivery

5. Where does a livestock futures price come from?

    a. The contract buyer sets the price

    b. The Exchange sets the price

    c. Prices are discovered through bids and offers between buyers and sellers

    d. The contract seller dictates the price

6. Who is on the other side of a hedger's position?

    a. Speculator

    b. Another hedger

    c. Could be either a hedger or a speculator

    d. The Exchange

7. Who provides the greatest amount of market liquidity?

   a. Hedgers

   b. Speculators

   c. The Exchange

   d. The Clearing House

8. Who has the right to choose the trading platform when initiating or closing out a position?

   a. CME Group

   b. Broker

   c. You, the customer

   d. Clearing firm

Answers are located in the Appendix.

CHAPTER 2

FINANCIAL INTEGRITY OF THE LIVESTOCK FUTURES MARKET

One of the key benefits of the futures market is the financial integrity of every contract that is traded and cleared at the exchange, a role fulfilled by CME Clearing. The obligation of a futures contract is ensured through the concept of **margin or performance bond**.

Every buyer and every seller of a futures contract must post and maintain a margin account to ensure their adherence to the terms of the futures contract. The Exchange establishes a minimum margin requirement per contract, called the "initial" margin, which usually ranges from 5–15% of the contract value. However, brokers may require their customers to post a margin that may be higher than the Exchange minimum. Margin is deposited into a "segregated" trading account with the customer's FCM. In segregated accounts customers' deposits are not commingled with their FCMS proprietary funds.

Although the absolute amount of margin is *not* a cost of trading futures, there is a cost associated with margin: interest. This can be the interest paid on the amount borrowed to fund the margin, or the opportunity cost of not having the earning power on the funds used as margin. It is not necessary to deposit cash as initial margin; there are different types of financial instruments that are acceptable to post as the initial margin requirement. As some forms of acceptable initial margin are interest bearing, the deposit of these forms of capital allow the customer to retain the earning power.

Once a position is initiated in a futures contract, the margin account will be adjusted twice daily, based on movements in the futures market. The margin account will receive a credit if the futures market moves in favor of the customer's position, or will be debited if the futures market moves against the position. This daily adjustment process, called **marked to market**, is based on the futures contract's settlement price for that day. Every open position for a particular futures contract will be marked to market at the end of the trading day against the same daily settlement price for that contract.

A **margin call** is a request from the commodity broker for the customer to deposit additional funds into their margin account. This occurs when the balance in the margin account falls below a specified *maintenance* margin level. The amount of the additional margin to be deposited must be enough to return the margin account balance back to the *initial* margin level.

Market participants receive margin calls when the futures market moves against their position.

- With a long (buy) futures position, a margin call is received if the market moves low enough to cause the margin account balance to fall below the maintenance level.
- With a short (sell) futures position, a margin call is received if the futures market moves high enough to cause the margin account balance to fall below the maintenance level.

NOTE FOR HEDGERS

A hedger's cash market position is always opposite to their futures market position. So if the futures market moves against a hedger's futures position, possibly resulting in a margin call, their cash market position should simultaneously be improving. This will be clarified in the later chapters highlighting hedge examples.

The margin system is a key concept which ensures the financial integrity of each and every futures and option contract cleared by CME Clearing.

To access additional information on margins, including current requirements, acceptable types, and an example of how they work, visit cmegroup.com/clearing.

CHAPTER 2 QUIZ

1. What guarantees the financial integrity of a futures contract?

   a. Premium

   b. Individual trader's word

   c. Margin

   d. Commission

2. When will a trader get a margin call on a short futures position?

   a. When a futures market increase causes the margin account balance to fall below the specified maintenance level

   b. Whenever the broker wants

   c. When the market settlement price remains steady

   d. Every day regardless of what happens to the market settlement price

3. What happens to a customer's margin funds that are posted?

   a. Invested

   b. Used to pay the commissions

   c. Put in a segregated margin account to ensure contract performance

   d. Deposited in any bank

4. Generally speaking, what percentage of a contract value is initial margin?

   a. 50%

   b. 100%

   c. 5-15%

   d. 200%

5. Which futures market participants are required to have a margin account?

   a. Hedgers

   b. Speculators

   c. All traders

Answers are located in the Appendix.

CHAPTER 3

LIVESTOCK CASH MARKET, BASIS AND GENERAL HEDGE THEORY

"Basis" is the most important factor impacting the result of a hedge strategy using either futures or options. The concept of basis is vital because it helps a livestock or meat buyer and seller determine:

1. **If** they should use futures (or options) to manage the price risk of their eventual cash market purchase or sale, and if so,
2. **When** to initiate, modify or close out their futures or options position, and then
3. **Who** they should eventually buy the actual livestock from or sell it to in the cash market

What is Basis?

Basis is the relationship between a *cash market price* and a *futures contract price*. As such, basis reflects the correlation of *the hedger's* local cash market to the futures market. The better the correlation between the two markets, the more effective the hedge strategy will be.

Basis equation:

Cash Market Price – Futures Market Price = Basis

Examples of Different Basis Levels:

CASH PRICE	MINUS FUTURES PRICE	EQUALS BASIS
$92.00/cwt.	$90.00/cwt.	+ 2.00 or 2.00 over
$85.00/cwt.	$90.00/cwt.	- 5.00 or 5.00 under
$90.00/cwt.	$90.00/cwt.	0, even or no basis

BASIS EQUATION

Keep in mind that although the basis equation is relatively simple and the amount of time required for the calculation is minimal, the importance and value of maintaining the local basis information should never be under-estimated.

Which Cash Market Price is Used?

Cash markets are the locations where the hedger regularly buys or sells the physical livestock product. There are numerous livestock cash markets in the world, but a hedger only needs to be concerned with *their local cash market(s)*. If they have more than one local cash market that they regularly buy livestock from or sell to, then they will have more than one basis to monitor.

Note that even if a hedger uses futures contracts to manage price risk, the eventual purchase or sale of the physical livestock product will usually occur at one of their local cash markets. As stated earlier, basis will be one of the deciding factors to determine the cash market in which they eventually transact.

Which Futures Market Price is Used?

Since there are also many different contract months for the same livestock futures product, the one the hedgers uses depends on whether they are calculating a **current** basis or a **deferred** basis.

For calculating a *current* basis, the hedgers should use today's cash market price minus the nearby futures contract price. The nearby futures contract is the month that is closest to the current time period, but not before.

Example 1: If today is March 1, then use the April Live Cattle futures contract

Example 2: If today is September 5, then use the October Lean Hog futures contract

Example 3: If today is December 10, then use the January Feeder Cattle futures contract

The current basis calculation is the more common of the two and will provide an excellent history of what the basis is expected to be at any given time of the year in the local cash market. Although basis history is not an exact science, it is a valuable tool in helping to manage cash market risk.

For calculating a *deferred basis*, the hedger uses a forward cash market quote minus the price of the futures contract month which is closest to but not before the specific time period when he plans to buy or sell the physical livestock product.

Example: In January, if a hedger gets a cash forward market quote for March physical delivery of cattle, they would use the April Live Cattle futures contract price in calculation of the deferred basis, i.e.,

Cash Forward Price (for March delivery) minus April Futures
= Deferred Basis

A *deferred basis* can be compared to what the hedgers expects the basis to be at a specific time period in the future. This comparison will help determine if one should use a futures contract or a cash market alternative, such as a cash forward contract, for their risk management positions. If the cash contract that is being offered has a better basis than is expected at the time of physical delivery, then they may choose to use the cash contract. However, if the expected basis is better than what is being offered via the cash market contract, then they may decide to use a futures market contract for their risk management needs.

In other words, the decision to use a futures contract or cash forward contract for hedging will depend on how the basis is expected to change from the current time period, to the time period that the hedger expects to buy or sell the physical livestock product.

How Can Basis Change?

Cash market prices and a futures market price for the same livestock product should be correlated, meaning that the two prices should move up and down together. Although the two markets *should* move in tandem, they don't necessarily move by the same amount. Any difference in the change in one market's price relative to the other market's change is a *change in basis*.

Stronger Basis

If the cash market price increases relative to the futures market price, then the basis is said to have *strengthened or gotten stronger*—the key word is "relative." It highlights that a basis can strengthen when prices are moving higher *or when prices are moving lower*.

Stronger Basis When Price Levels Increase

Basis can strengthen if the cash market price increases by an amount greater than the increase in the futures market price.

Example: If the cash market price for live cattle increased by $2 per hundred weight (cwt) and the Live Cattle futures price increased by $1 per cwt, then the basis strengthened by $1 from the previous basis level.

Stronger Basis When Price Levels Decrease

Basis can also strengthen when the cash market price declines by an amount less than the decline in the futures market price.

Example: If the cash market price for hogs declined by 50 cents per cwt and the Lean Hog futures price declined by 70 cents per cwt, the basis strengthened by 20 cents per cwt.

STRENGTHENING BASIS

Note that when a local basis number becomes more positive or less negative over time, the basis has strengthened.

Stronger Basis Movement

Strengthen
More positive or
Less negative
Benefits Short Hedgers

+1.50
+1.00
+0.50
+0
-0.50
-1.00
-1.50

Who Benefits From a Stronger Basis?

As we have learned so far, the cash market price is a local factor and the futures market price is a global benchmark that affects everyone who buys or sells that livestock product, regardless of where they are located.

In other words, the futures contract price is identical for *all* market participants at any given time, while *the hedger's* cash market price is pertinent only to those in his local area. Therefore, the hedger's basis is a reflection of his local cash market relative to the global benchmark futures market. As such, *selling hedgers of physical livestock products will benefit if and when the basis strengthens*. After all, sellers prefer selling in a "strong" cash market rather than a weak cash market. Therefore, if the basis strengthens over time, the seller will receive a relatively higher net selling price.

Weaker Basis

If the cash market price decreases *relative* to a futures market price, then the basis *has weakened or gotten weaker*. Again, the key word is "relative." It highlights that a basis can weaken when prices are moving lower or higher.

Weaker Basis When Price Levels Decrease

Basis can *weaken* if the cash market price decreases by an amount greater than the decrease in the futures market price.

Example: If the cash market price for feeder cattle decreased by $1.50 per cwt and the Feeder Cattle futures market price decreased by $1 per cwt, then the basis weakened by 50 cents from the previous basis level.

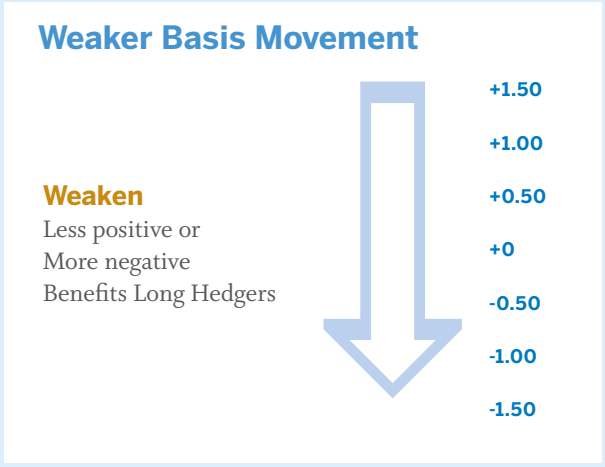
Weaker Basis When Price Levels Increase

Basis can also weaken when the cash market price increases by an amount less than the increase in the futures market price.

Example: If the cash market price for hogs increased by 50 cents per cwt and the Lean Hog futures price increased by 60 cents per cwt, the basis weakened by 10 cents per cwt.

WEAKENING BASIS

Note that when a local basis number becomes less positive or more negative over time, the basis has weakened.



Who Benefits From a Weaker Basis?

Think about the market participants who may prefer to buy in a weak cash market. Following this rationale, *buyers of physical livestock products (buying hedgers) will benefit if and when the basis weakens*. That is, if the basis weakens over time, the buyer will pay a relatively lower net purchase price.

Getting Started With Basis

One of the first things the hedger needs to decide is how often to calculate his local basis--usually more data is better.

As such, calculating the daily basis is the most common. The hedger should use the local cash market price that occurs around the time of the futures market settlement (currently 1:00 p.m. Chicago time) and the futures contract's daily settlement price.

Some people prefer to track the weekly basis. For this type of information, it is important to be consistent in using data from the same day every week. Many market participants who track basis weekly may prefer to use data from Tuesday, Wednesday or Thursday, rather than from Monday or Friday, which may have greater volatility.

Although initiating a historical basis table and/or basis chart and moving forward may be easy, it may take a little more work to obtain local basis information from the past. However, hedgers may find this additional research effort very worthwhile when they begin their price risk management program.

A hedger may start their research by contacting local hedge brokers, county extension offices, lenders, or market advisors. Also, university livestock marketing professors may have basis information for their area.

Tracking Basis

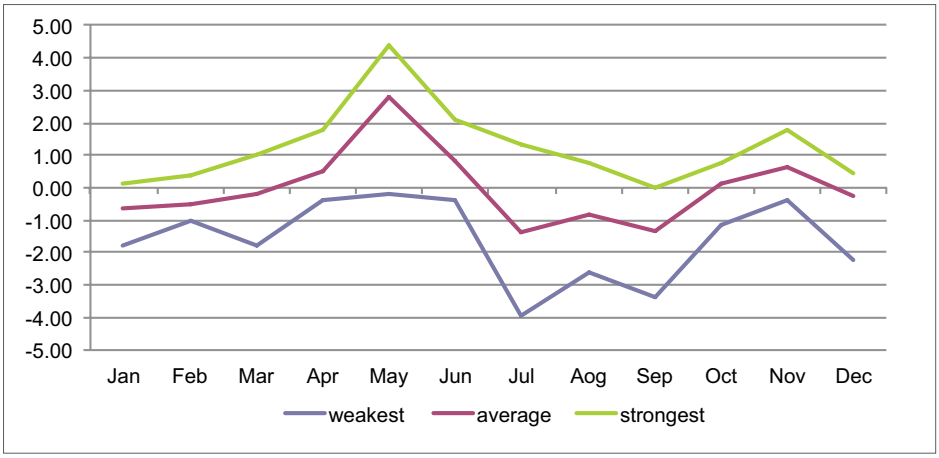
Basis can be done with pencil and paper, or on a computer spreadsheet. The following is a sample cattle basis table:

Sample Basis Spreadsheet

DATE (MM/DD/YR)	CASH MARKET	FUTURES CONTRACT MONTH	BASIS	COMMENTS
03/15/xxxx	115.00	120.00 (April)	- 5.00	Heavy local selling
03/16/xxxx	116.50	121.00 (April)	- 4.50	Selling slows pace
03/17/xxxx	115.00	120.50 (April)	- 5.50	No news

Once the data is collected in tabular form, the hedger may want to create a basis chart, which will provide a visual effect of the basis changes.

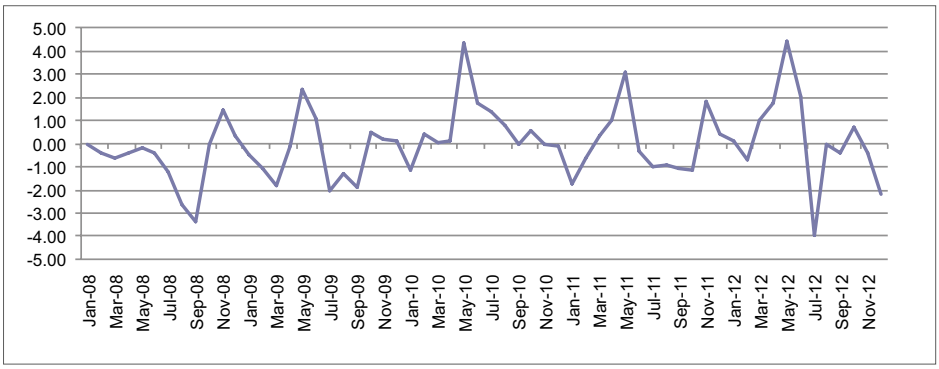
Seasonal Live Cattle Basis 2008 – 2012



With several years of basis information, a chart can be created to highlight the strongest, weakest, average and range of basis for a particular week of the calendar year.

Source: CME Group and USDA

Live Cattle Monthly Basis (Cash-Futures)



As stated earlier, knowing what the forward quoted basis is compared to where the basis is expected to be during any calendar week of the year, will help make the decision of which risk management contract and strategy appears to work best.

Source: CME Group and USDA

BASIS DATA

The format or frequency of basis data collection is a choice. The most important thing is to just get started collecting it.

Basis Summary

From the amount of information devoted to the topic of basis in this publication, it should be clear how important this concept is to price risk management. As such, a good student of basis should have an easier task of becoming a good student of price risk management.

General Hedging Theory

There are two primary elements to hedging theory: the cash/futures price relationship and the market positions of the hedge.

1. For a hedge to be effective there has to be a positive relationship, or correlation, between the hedger's local cash market price and a futures market price for the same or related commodity. If there is a positive correlation, as one market moves the other market also moves in the same direction, even though their prices may not change on a 1 to 1 basis. That change would indicate a 100% correlation or perfect correlation, but it

is usually less than this. A general rule of thumb is that 80% or better correlation should result in an effective hedge.

2. To be hedged is to have opposite positions in the cash market and the futures market. That is, one would be long the cash market and short futures, or short the cash market and long futures. These opposite positions need to be maintained throughout the life of the hedge.

Hedge Results

The result of a hedge should be the same regardless of which direction the price moves. In a properly executed hedge, one would experience a loss in one market and a gain in the other, i.e., a loss in the futures market would be offset by a gain in the cash market and vice versa. The exception may occur when there is a change in the correlation or in other words, when there is a change in basis.

HEDGING INCLUDES CASH + FUTURES

A common misconception about hedging is that the hedge is only the futures market position. Remember that a hedge always consists of a futures market position and a cash market position. It is the combined result of these two market positions that determines the result of the hedge.

CHAPTER 3 QUIZ

1. What is Basis?

   a. Relationship between two different futures contract prices

   b. Relationship between two different cash market prices

   c. Relationship between a cash market price and a futures market price

   d. Relationship between a margin level and the commission

2. In the basis equation, which factor is the same for all locations in the world?

   a. The cash market price

   b. The option strike price

   c. The futures market price

   d. The basis

3. What happens if a cash market price gains relative to a futures price over time?

   a. Basis strengthens and benefits the long hedger

   b. Basis strengthens and benefits the short hedger

   c. Basis weakens and benefits the short hedger

   d. Doesn't have an impact on basis

4. What is the relationship between a cash market position and a futures market position in a hedge?

   a. The positions are identical

   b. Opposite of each other

   c. The futures position is always larger than the cash market position

   d. The futures position is always smaller than the cash market position

5. For a hedge to be effective, what is necessary?

   a. Integration between the cash and futures market

   b. Simulation between the cash and futures market

   c. Correlation between the cash and futures market prices

   d. Inflation in the economy

Answers are located in the Appendix.

CHAPTER 4

SHORT FUTURES HEDGE: PRICE RISK MANAGEMENT FOR LIVESTOCK SELLERS

The **short futures hedge** is one of the most basic price risk management strategies for an individual or firm who has intentions of selling cash (physical) livestock or meat at some point in the future. A potential seller of livestock or livestock products is primarily concerned about falling prices in their local markets. Other potential short hedgers would be anyone who is holding inventory and as such, is exposed to the risk of falling prices as it will negatively impact their inventory value.

Examples of Potential Short Hedgers

- Cattle ranchers
- Hog producers
- Feedlots
- Packers holding inventory
- Exporters
- Food related businesses holding inventory (e.g., restaurants, butchers, food processors)

Concept and Mechanics of the Short Futures Hedge

The *concept* of a short futures hedge is to use a futures contract to manage the risk of falling prices in the hedger's local cash market at some point in the future. Price risk management can be used to protect either short term or long term sales, as well as inventory value.

The mechanics of a short hedge consists of two necessary features:

1. The short hedge always consists of two market positions: one in the livestock futures market and one in a local cash market. The initial short futures market position in a short hedge is solely for the protection against falling cash livestock prices. As such, the short futures position acts as a temporary substitute for the eventual cash market sale of the actual livestock or livestock product.

   At all times during the life of a hedge, the futures market position should be opposite the cash market position. For a short hedge, the initial cash market position is long the physical livestock or livestock product, which they are either producing or own in the case of inventory. Therefore, the initial futures position of a short hedge is short futures.

These market positions of a short hedge are maintained until the time that the risk of falling prices no longer exists for that specific cash sale transaction. This occurs when the actual livestock or inventory is sold or priced in the cash market. Immediately upon the sale or pricing of the actual livestock or physical inventory, the futures position is no longer needed and should be offset by buying back the initial short futures position.

If a hedger does not maintain simultaneous opposite positions in the cash and futures market, it is no longer considered a hedge. It may even be considered to be a speculative transaction.

2. The cash market price and the futures market price are positively correlated, moving up and down together. Remember, that although the two markets move in the same direction, the amount of change in one market could be different than the other. As that occurs there would be a change in the basis over time. The short (selling) hedger is looking for opportunities for their local basis to strengthen by the time the hedge is closed out.

Short Hedge Results

When combining the two previously discussed features of a short hedge, if the risk of falling prices actually occurs, the lower selling price in the cash market should be offset by a gain in the futures market. If the price risk does not occur and prices increase, the higher cash selling price will be offset by a loss in the futures market position. Regardless of the price direction, a loss in one market should be offset by a gain in the other. When initiating a position, the hedger obviously does not know which market will have a gain and which one will have a loss. However, they should be secure in knowing that they have a position in the futures market that should protect them against falling prices in their local market.

SHORT HEDGE EXAMPLE # 1

Falling Hog Prices with Basis Remaining as Expected

DATE	CASH MARKET	FUTURES MARKET	BASIS
March 15	Expected hog price at $70.00/cwt based on expected September basis of -5.00 (under) October futures	Short October Lean Hogs/cwt at $75.00	- 5.00
September 25	Sell hogs at $65.00/cwt	Buy (offset) October Lean Hogs at $70.00/cwt	- 5.00
Results	Lower revenue of $5.00	$5.00 gain	No change

Sell cash hogs at	$65.00/cwt
Futures gain	+ 5.00
Net selling price	**$70.00/cwt**

Note: Although the cash market for hogs declined from March to September resulting in lower revenue from the cash sale, the futures market position resulted in a gain, which offset the lower cash selling price. As such, the short hedger achieved price protection and the expected selling price of $70.00.

SHORT HEDGE EXAMPLE # 2

Rising Prices with Basis Remaining as Expected

DATE	CASH MARKET	FUTURES MARKET	BASIS
March 15	Expected hog price at $70.00/cwt based on expected September basis of -5.00 (under) October futures	Short October Lean Hogs at $75.00/cwt	- 5.00
September 25	Sell hogs at $73.00/cwt	Buy (offset) October Lean Hogs at $78.00/cwt	- 5.00
Results	Higher revenue of $3.00	$3.00 loss	No change

Sell cash hogs at	$73.00/cwt
Futures gain	- 3.00
Net selling price	**$70.00/cwt**

Note: Although the cash market for hogs rallied from March to September resulting in higher revenue from the cash sale, the futures market position resulted in a loss, which offset the higher cash selling price. As such, the short hedger again achieved the expected selling price of $70.00.

SHORT HEDGE EXAMPLE # 3

Falling Prices with Stronger than Expected Basis

DATE	CASH MARKET	FUTURES MARKET	BASIS
March 15	Expected hog price at $70.00/cwt based on expected September basis of -5.00 (under) October futures	Short October Lean Hogs at $75.00/cwt	- 5.00
September 25	Sell hogs at $68.00/cwt	Buy (offset) October Lean Hogs at $70.00/cwt	- 2.00
Results	Lower revenue of $2.00	$5.00 gain	3.00 basis gain

Sell cash hogs at	$68.00/cwt
Futures gain	+ 5.00
Net selling price	**$73.00/cwt**

Note: As a result of the cash market declining less than the futures market price, the basis improved (strengthened). Although the cash market for hogs declined from March to September resulting in lower revenue from the cash sale, the gain on the futures market position more than offset the lower revenue. Due to a stronger basis at the time of the cash sale, the short hedger received $3.00 more than the expected selling price of $70.00.

SHORT HEDGE EXAMPLE # 4

Rising Prices with Weaker than Expected Basis

DATE	CASH MARKET	FUTURES MARKET	BASIS
March 15	Expected hog price at $70.00/cwt based on expected September basis of -5.00 (under) October futures	Short October Lean Hogs at $75.00/cwt	- 5.00
September 25	Sell hogs at $71.00/cwt	Buy (offset) October Lean Hogs at $77.00/cwt	- 6.00
Results	Higher revenue of $1.00	$2.00 loss	1.00 basis loss

Sell cash hogs at	$71.00/cwt
Futures gain	- 2.00
Net selling price	**$69.00/cwt**

Note: Overall, the basis weakened as a result of the cash market increasing less than the increase in the futures market price. Although the cash market for hogs rallied from March to September resulting in higher revenue from the cash sale, the loss on the futures market position exceeded the gain in the cash market. As a result of the weaker basis at the time of the cash sale, the short hedger received $1.00 less than the expected selling price of $70.00.

Highlights of the Short Hedge

Regardless of the price change over time, a loss in either the cash or futures market is offset by a gain in the other market, resulting in the same net selling price. The one key factor which could affect this net outcome is a change in the basis at the time of the cash market sale. A short (selling) hedger's net result will improve if the basis strengthens, and the net result will be worse if the basis weakens at the time of the cash sale. In addition to the impact of a basis change, the short hedger needs to subtract the futures brokerage commission from the net result.

SHORT HEDGE

A short hedge is the use of two markets (cash and futures) to establish a selling price, and it is this selling price that will determine the profitability of the business. Although there may be different nuances to each type of livestock, this key concept applies to any individual or firm who plans to sell cattle, feeder cattle or hogs.

CHAPTER 4 QUIZ

1. What are the short hedger's initial positions?
    a. Short cash market and long futures market
    b. Short cash market and short futures market
    c. Long cash market and short futures market
    d. Long cash market and long futures market?
2. What change will benefit a short hedger?
    a. Falling prices
    b. Rising prices
    c. Stronger basis
    d. Weaker basis
3. After a short hedge is initiated, what changes impact the result of the hedge?
    a. Change in the cash market price
    b. Change in the futures market price
    c. Change in the margin level
    d. Change in the basis
4. If price levels go lower after a short hedge is initiated, what are the results?
    a. Gain in the cash market and gain in the futures market
    b. Loss in the cash market and loss in the futures market
    c. Gain in the cash market and loss in the futures market
    d. Loss in the cash market and gain in the futures market
5. What will have an impact on the net hedged selling price?
    a. Stronger basis will improve the results of the hedge
    b. Brokerage commission must be subtracted from the results
    c. Interest costs associated with the short hedger's margin account
    d. All of the above

Answers are located in the Appendix.

CHAPTER 5

LONG FUTURES HEDGE: PRICE RISK MANAGEMENT FOR LIVESTOCK BUYERS

The **long futures hedge** is one of the most basic price risk management strategies for an individual or firm who has intentions of buying cash (physical) livestock or livestock products at some point in the future. A potential buyer of livestock or livestock products is primarily concerned about rising prices in their local markets, which would have a negative impact on their profitability.

Examples of Potential Long Livestock Hedgers

- Packers
- Feedlots
- Importers
- Restaurants
- Food processors
- Livestock producers/feedlots (also potential long feed grain hedgers)

Concept and Mechanics of the Long Futures Hedge

The *concept* of a long futures hedge is to use a futures contract to manage the risk of rising prices in the hedger's local cash market at some point in the future. Price risk management can be used to protect either short term or long term purchases.

The mechanics of a long hedge consists of two necessary features:

1. The long hedge always consists of two market positions: one in the livestock futures market and one in a local cash market. The initial long futures market position in a long hedge is solely for protection against rising livestock prices in the hedger's local market.

   At all times during the life of a long hedge, the futures market position has to be opposite the cash market position. For a long hedge, the initial cash market position is short the physical livestock or product, which means they do not currently own it but will need to buy it in the future. Therefore, the initial futures position of a long hedge is long futures. As such, the initial long futures position is a temporary substitute for the eventual purchase in the cash market.

   The market positions of a long hedge are maintained until the time that the risk of rising prices no longer exists for that specific cash purchase. That occurs when the actual livestock or livestock product is bought or priced in the cash market. Immediately upon the purchase or pricing of the livestock or livestock product, the futures position is no longer needed and should be offset by selling back the initial long futures position.

2. The cash market price and the futures market price are positively correlated, moving up and down together. Again, remember that although the two markets move in the same direction, the amount of change in one market could be different than the other. As that occurs, there would be a change in the basis over time. The long (buying) hedger is looking for opportunities for their local basis to weaken by the time the hedge is closed out.

Long Hedge Results

When combining the two previously discussed features of a long hedge, if the risk of rising prices actually occurs, the higher purchase price in the cash market should be offset by a gain in the futures market. If the price risk does not occur and prices actually fall, the loss on the futures market position is offset by a lower cash purchase price. Regardless of the price direction, a loss in one market should be offset by a gain in the other. When initiating a hedge, it is not known which market will have a gain and which one will have a loss. However, the long hedger should be secure in knowing that their position in the futures market should provide protection against rising prices in their local market.

LONG HEDGE EXAMPLE # 1

Rising Feeder Cattle Prices with Basis Remaining as Expected

DATE	CASH MARKET	FUTURES MARKET	BASIS
September 4	Expected feeder cattle price at $152.00/cwt based on expected February basis of + 2.00 (over) March futures	Long March Feeder Cattle at $150.00/cwt	+ 2.00
February 25	Buy feeder cattle at $160.00/cwt	Sell (offset) March Feeder Cattle at $158.00/cwt	+ 2.00
Results	Higher cost of $8.00	$8.00 gain	No change

Sell cash feeder cattle at	$160.00/cwt
Futures gain	- 8.00
Net selling price	**$152.00/cwt**

Note: Although the cash market for feeder cattle rallied from September to February resulting in higher cash costs, the futures market position resulted in a gain, which lowered the net cash purchase price. As such, the long hedger achieved price protection and the expected purchase price of $152.00.

LONG HEDGE EXAMPLE # 2

Falling Feeder Cattle Prices with Basis Remaining as Expected

DATE	CASH MARKET	FUTURES MARKET	BASIS
September 4	Expected feeder cattle price at $152.00/cwt based on expected February basis of + 2.00 (over) March futures	Long March Feeder Cattle at $150.00/cwt	+ 2.00
February 25	Buy feeder cattle at $148.00/cwt	Sell March Feeder Cattle at $146.00/cwt	+ 2.00
Results	Lower cost of $4.00	$4.00 loss	No change

Buy cash feeder cattle at	$148.00/cwt
Futures loss	+ 4.00
Net selling price	**$152.00/cwt**

Note: Although the cash market for feeder cattle declined from September to February resulting in lower cash costs, the futures market position resulted in a loss, which increased the net cash purchase price. As such, the long hedger again achieved the expected purchase price of $152.00.

LONG HEDGE EXAMPLE # 3

Rising Feeder Cattle Prices with Weaker than Expected Basis

DATE	CASH MARKET	FUTURES MARKET	BASIS
September 4	Expected feeder cattle price at $152.00/cwt based on expected February basis of + 2.00 (over) March futures	Long March Feeder Cattle at 150.00/cwt	+ 2.00
February 25	Buy feeder cattle at $155.00/cwt	Sell March Feeder Cattle at 156.00/cwt	- 1.00
Results	Higher cost of $3.00	$6.00 gain	3.00 basis gain

Buy cash feeder cattle at	$155.00/cwt
Futures gain	- 6.00
Net purchase price	**$149.00/cwt**

Note: Although the cash market for feeder cattle rallied from September to February resulting in higher cash costs, the futures market position resulted in a gain, which more than offset the higher cash purchase price. As such, the long hedger improved (lowered) their expected net purchase price by the amount of the basis improvement (weakening) of 3.00.

LONG HEDGE EXAMPLE # 4

Falling Prices with Stronger than Expected Basis

DATE	CASH MARKET	FUTURES MARKET	BASIS
September 4	Expected feeder cattle price at $152.00/cwt based on expected February basis of + 2.00 (over) March futures	Long March Feeder Cattle at 150.00/cwt	+ 2.00
February 25	Buy feeder cattle at $148.00/cwt	Sell March Feeder Cattle at 144.00/cwt	+ 4.00
Results	Lower cost of $4.00/cwt	$6.00/cwt loss	2.00 basis loss

Buy cash feeder cattle at	$148.00/cwt
Futures Loss	+ 6.00
Net purchase price	**$154.00/cwt**

Note: Although the cash market for feeder cattle declined from September to February resulting in lower cash costs, the futures market position resulted in a greater loss, which more than offset the lower cash purchase price. As such, the long hedger's net purchase price was $2.00 greater than expected due to the amount that the basis strengthened at the time of the cash transaction.

Highlights of the Long Hedge

Regardless of the price change over time, a loss in either the cash or futures market is offset by a gain in the other market, resulting in the same net buying price. The one key factor which could affect this net outcome is a change in the basis at the time of the cash market purchase. A long (buying) hedger's net result will improve if the basis weakens, and the net result will be worse if the basis strengthens at the time of the cash purchase. In addition to the impact of a change in the basis, the long hedger must add the futures brokerage commission to the net purchase price.

LONG HEDGE

A long hedge is the use of two markets to establish a purchase price, and it is this price that will determine the profitability of the business. Although there may be different nuances to each type of livestock, this basic and key concept applies to any individual or firm who plans to buy cattle, feeder cattle or hogs.

CHAPTER 5 QUIZ

1. What type of potential hedger is a livestock producer?

    a. Only a short hedger

    b. A short hedger for the sale of their livestock

    c. A long hedger for the purchase of their feed

    d. Both B and C

2. What will benefit a long livestock hedge after it is initiated?

    a. Weaker basis

    b. Stronger basis

    c. Higher prices

    d. Lower prices

3. Who are potential long livestock hedgers?

    a. Restaurants

    b. Packers

    c. Feedlots who buy feeder stock

    d. All the above

4. Which market has an impact on the final net result of a long futures hedge?

    a. Cash market

    b. Futures market

    c. Option market

    d. Both A and B

5. What market condition is necessary for an effective long hedge?

    a. Simulation between the cash and futures market

    b. Integration between the cash and futures market

    c. Variation between the cash and futures market

    d. Correlation between the cash and futures market

Answers are located at the end of this publication in the Appendix.

CHAPTER 6

OVERVIEW OF THE LIVESTOCK OPTIONS MARKET

The extensive array of livestock risk management tools offered by the CME includes options on Live Cattle, Feeder Cattle and Lean Hog futures. These option contracts can be utilized in a variety of ways to provide protection and opportunity.

For example, a livestock producer using options could obtain downside protection similar to a short futures position, but unlike a short futures hedge, they also retain the opportunity to benefit from higher prices. Conversely, a livestock buyer could obtain upside price protection much like a long futures hedge, but unlike a long futures hedge, they may still have the opportunity to benefit from lower prices.

This is possible because of the foundation of an option contract: options convey *rights* and not obligations. The rights in an option are either to buy **(call option)** or to sell **(put option)** the underlying futures contract. For every option that is traded, there is a buyer and a seller. The option buyer pays the premium (cost of the option) to receive the rights within the specific option. Since an option buyer has rights and no market obligations to perform, they do not have performance bond/margin requirements with that position. On the other hand, the option seller who received the premium for selling those rights has a market obligation to fulfill them and as such, they will have performance bond/margin requirements.

In order to use livestock options as effective risk management tools, it is imperative to understand the unique terminology, concepts and pricing of these instruments.

CME LIVESTOCK OPTION CONTRACT SPECIFICATIONS

Livestock Option Contract Highlights

	LIVE CATTLE OPTIONS	FEEDER CATTLE OPTIONS	LEAN HOG OPTION
Underlying Contract	40,000 pound (lb.) CME Live Cattle futures	50,000 pound (lb.) CME Feeder Cattle futures	40,000 pound (lb.) CME Lean Hog futures
Pricing unit (premium)	Cents per pound	Cents per pound	Cents per pound
Tick size (minimum premium fluctuation)	Full tick: $0.00025/lb. Half tick: $0.000125/lb.	Full tick: $0.00025/lb. Half tick: $0.000125/lb.	Full tick: $0.00025/lb. Half tick: $0.000125/lb.
Strike Price Intervals	$0.02/lb. for all months plus $0.01/lb. for front two months	$0.02/lb. for all months plus $0.01/lb. for front two months plus $0.005/lb. for spot mo.	$0.02/lb. for all months plus $0.01/lb. for front two months
Contract Months	Standard: Feb, Apr, Jun, Aug, Oct, Dec Serial: Jan, Mar, May, Jul, Sep, Nov	Standard: Jan, Mar, Apr, May, Aug, Sep, Oct, Nov	Standard: Feb, Apr, May, Jun, Jul, Aug, Oct, Dec
Ticker Symbol CME Globex	LE	GF	HE
Ticker Symbol Trading Floor	CK/PK	KF/JF	CH/PH
Trading Hours CME Globex	Monday: 9:05 a.m. to 4:00 p.m. Central Time Tuesday – Thursday: 8:00 a.m. to 4:00 p.m. Central Time Friday: 8:00 a.m. to 1:55 p.m. Central Time		
Trading Hours Trading Floor (Chicago)	Monday 9:05 a.m. to 1:02 p.m. Central Time Tuesday – Friday 8:00 a.m. to 1:02 p.m. Central Time		

For additional Livestock option contract specifications, visit **cmegroup.com/agriculture**.

Option Terminology Concepts

An option is a legally binding contract that provides a right, but not an obligation to either buy or sell an underlying commodity at a specific price within a specific time period in exchange for a premium.

Calls versus Puts

There are two types of options: call options and put options. Livestock *call options contain the right to buy* a specific livestock futures contract at a specific price prior to a specific expiration date. Livestock *put options contain the right to sell* a specific livestock futures contract at a specific price prior to a specific expiration date.

It is important to note that calls and puts are two completely separate and distinct option contracts. They are not offsetting contract positions.

Call Option Positions

For every call option, there is a *call buyer* and a *call seller*; just as with futures, one could elect to initially go long (buy) or short (sell) a call option. A long call option is the opposite and offsetting position to a short call option of the same type.

The call option buyer pays a premium and receives the right to buy the underlying livestock futures contract. Since the call option buyer has the *right* to take a long futures position and not an *obligation*, they do not have to post or maintain margin or a performance bond. They are only required to pay the call option premium up front. A call option buyer is also referred to as a "**holder**", meaning they are holding the rights to buy the underlying livestock futures contract.

The call option seller is also known as either a "**writer**" or "**grantor**," as they grant the rights to buy and are then obligated to sell the underlying livestock futures contract. The call option seller receives the premium in exchange for granting the rights to the buyer. They have an obligation to sell the underlying livestock futures contract to the call option buyer, if and when the call option buyer decides to "**exercise**" the call option, i.e., to use the rights conveyed in the option. The call option seller must post and maintain a performance bond or margin account to ensure that the rights will be fulfilled.

A call option is offset by taking the opposite position in an identical call option. In other words, if a call is initially bought and later an identical call is sold, the option positions are offset and the initial option buyer is out of the market. Likewise, if a call is initially sold and later an identical call is purchased, the two option positions are offset and the initial option seller is out of the market.

Note that only the call option buyer can exercise (use) the right to buy livestock futures. The call option seller is obligated to fulfill that right any time the buyer chooses to exercise it.

Put Option Positions

For every put option, there is a **put buyer and a put seller**. A long (buy) put option position is the opposite and offsetting position to a short (sell) put option.

The put option *buyer* pays a premium and *receives the right to sell* the underlying livestock futures contract. Since the put option buyer has the *right* to take a short futures position and not an *obligation*, they do not have to post or maintain performance bond or margin. They are only required to pay the put option premium up front.

A put option buyer is also referred to as a "holder", meaning they are holding the rights to sell the underlying livestock futures contract.

The put option seller is also known as the "writer" or "grantor," as they grant the rights to sell and are obligated to sell the underlying livestock futures contract. The put option seller receives the option premium in exchange for granting the rights to the buyer. The put option *seller* has an obligation to buy the underlying livestock futures contract if and when the put option buyer decides to "exercise" the put option, i.e., use the rights conveyed in the option. To ensure that the rights will be fulfilled, the put option seller must post and maintain a performance bond or margin account.

A put option is offset by trading the opposite position in an identical put option. In other words, if a put option is initially bought, and later an identical put is sold, the option positions are offset and the initial put option buyer is out of the market. Likewise, if a put option is initially sold and later an identical put option is bought, the two option positions are offset and the initial put option seller is out of the market.

Again, note that only the put option buyer can exercise (use) the right to sell livestock futures. The put option seller is obligated to fulfill that right any time the buyer chooses to exercise it.

Summary of Option Positions

	JULY 86 LEAN HOG CALL OPTIONS	APRIL 110 LIVE CATTLE PUT OPTIONS
Long (Buy) Option Position (Pays premium)	Right to buy July Lean Hog futures at $86.00/cwt.	Right to sell April Live Cattle futures at $110.00/cwt.
Short (Sell) Option Position (Receives premium)	Obligation to sell July Lean Hog futures at $86.00/cwt.	Obligation to buy April Live Cattle futures at $110.00/cwt.

IMPORTANT NOTE FOR SELLING OPTIONS

Due to the amount of risk associated with selling either call options or put options, many option sellers will look to minimize this risk by taking another position in a different but related futures, option or cash market contract. Depending on the trader's objectives, the option seller could be either a hedger with specific risk management objectives, or a speculator with specific opinions on market movement.

Strike Price

The option strike price is the price at which the underlying futures position will be assumed if the option is exercised, i.e., the price of the long futures position in the case of a call, or a short futures position in the case of a put. Strike prices are also referred to as **exercise** prices. Option traders will choose from an initial array of option strike prices in intervals established by the Exchange for each livestock commodity. As the underlying livestock futures market moves in either direction, the Exchange will make additional strike prices available for trading.

Note that each strike price represents a different option contract. Once an option is either bought or sold, the chosen strike price is a specific fixed part of that option contract.

Underlying Contract

A livestock option's underlying contract is the respective livestock futures contract of a specific contract month. For example, the underlying contract to a February Live Cattle option (call or put) is a February Live Cattle futures contract. The underlying contract to a September Feeder Cattle option (call or put) is a September Feeder Cattle futures contract.

Standard options contract months are listed to correspond to the same months as the underlying futures. Standard options become available for trading at least one day following the first day of trading of the underlying futures. As such, some livestock options will be available months or even years in advance of their expiration.

In addition, other options with shorter life cycles are available for trading. They are used by livestock hedgers who want short-term protection at a relatively lower cost, or by a speculator interested in short term opportunities.

Serial options are listed for the months which are not a part of the standard livestock futures contract cycle, and usually have a lifespan of 45 to 60 days until to expiration. Since serial options have months not included in the standard livestock futures cycle, their underlying futures contract is the one closest, but not prior to, the serial option month.

Weekly options are listed to expire every Friday that is not an expiration of a standard or serial option. Livestock traders may use weekly options to manage "event driven" risk, e.g., to obtain price protection or take a position in the market prior to a major government report. The underlying futures contract to a weekly option is the futures month closest to but not prior to the weekly option. Note: weekly options are only listed on Live Cattle futures.

The primary advantage to both the serial and weekly options is that they usually trade at a lower premium due to their shorter duration, which means the cost of short term risk management is relatively less. This will become clearer in the discussion on option premium.

Option Expiration

Call and put option rights have an expiration date, after which the option can no longer be exercised by the option buyer and the value of those expired options is zero.

LIVESTOCK OPTION EXPIRATION INFORMATION

Live Cattle options expire on the first Friday of the option contract month at 1:00 p.m. Chicago time. Feeder Cattle options expire on the last Thursday of the option contract month at 12:00 p.m. Chicago time, unless it is an Exchange holiday. Lean Hog options expire on the 10th business day of the option contract month at 12:00 p.m. Chicago time. Note, for a livestock hedger using grain and oilseed options to manage the price risk of their feed, it is important to know that the grain and oilseed options normally expire on the third Friday of the calendar month prior to the option month.

Option Pricing

Premium is one of the most important concepts in option trading. The premium is the price or cost of the option paid by the option buyer and received by the option seller. Premiums are also referred to as the current *value* of the rights in an option.

Although the initial option premium is fixed as a cost to the option buyer, the price or value of the option will fluctuate throughout its life. In other words, when an option is bought, the initial premium paid is the maximum cost of that option strategy to the buyer. If an option is sold, the initial premium collected is the maximum gain on that strategy to the seller.

Premium is the only term of an option contract that is negotiated in the marketplace, on CME Globex. Option premiums are not set by the Exchange.

Although the option premium is quoted as a single price, it can be broken down into two components: **Intrinsic Value and Time Value:**

Option Premium = Intrinsic Value + Time Value

So what are the major factors that could impact and change the premium throughout the life of an option? Let's review the market factors that affect these two key components.

Intrinsic Value

Intrinsic value is the value of an option if it is exercised immediately. Intrinsic value is determined by the relationship between the option *strike price and the current underlying futures price*.

A call option has intrinsic value if the strike price is lower than the underlying futures price. In other words, it gives the holder the right to buy (or go long) futures at a price that is below the current futures price. The intrinsic value is the difference between the strike price and the underlying futures price. For example, if an August Feeder Cattle call option has a strike price of 120 (i.e., the right to buy August Feeder Cattle futures at $120/cwt) and the underlying August Feeder Cattle futures contract is currently trading at 122, the call option's intrinsic value is $2.00/cwt.

A put option will have *intrinsic* value if the put strike price is higher than the underlying futures price. In other words, it gives the holder the right to sell (or go short) the underlying futures at a price that is above the current underlying futures price. For example, if an August Feeder Cattle put option has a strike price of 120, i.e., contains the right to sell August Feeder Cattle futures at 120) and the underlying August Feeder Cattle futures contract is currently trading at 115, the intrinsic value of that put option is $5.00/cwt.

Option Classifications

An option may be classified in one of three ways at any point in its life, based on the relationship between the strike price (a fixed element of the option) and the current underlying futures contract price (a variable element).

In-the-Money options are options that have intrinsic value. A call option is in-the-money when the strike price is below the current futures price, and a put option is in-the-money when the strike price is above the current underlying futures price.

At-the-Money options are options whose strike price is identical or close to the underlying futures price. At-the-money options have no intrinsic value—this applies to both calls and puts.

Out-of the-Money options also have no immediate intrinsic value. A call option is out-of-the-money when the strike price is above the current underlying futures, and a put option is out-of the-money when the strike price is below the current underlying futures.

Note that option classifications apply to the current time period. In other words, as the underlying futures price changes, the option classification may change as well, i.e., move from out-of the-money to at- or in-the-money, and vice versa.

Option Classifications

	CALL OPTION	PUT OPTION
In-the-Money	Call Strike Price < Futures Price	Put Strike Price > Futures Price
At-the-Money	Call Strike Price = Futures Price	Put Strike Price = Futures Price
Out-of the-Money	Call Strike Price > Futures Price	Put Strike Price < Futures Price

Time Value

The option's time value is simply the option premium minus the intrinsic value:

Time Value = Option Premium – Intrinsic Value

Mathematically, calculating intrinsic or time value is relatively simple. However, determining what affects an option's time value is a little more complex. Time value is impacted by time remaining to expiration, volatility, and interest rates. Time to expiration and volatility are the two most dominating factors.

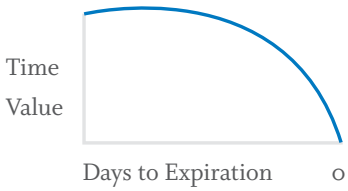
Time, or the number of days to expiration, is the obvious factor that impacts time value. Everything else remaining equal, the greater the amount of time left in the life of an option, the greater the time value portion of the premium. "Time decay" is the decline in time value as there are fewer days remaining until option expiration. Time value decay occurs at an increasing rate as expiration approaches. This works against option buyers and in favor of option sellers.

TIME VALUE AND OPTION PREMIUM

Generally speaking, the premiums associated with standard, serial and weekly options are heavily affected by the option's time value. Standard options usually have the longest lifespan, followed by serial options and then weekly options. As such, serial and weekly options are usually lower cost alternatives to managing short term livestock price risk. Their shorter lifespans mean lower time value, resulting in lower premiums.

Volatility is the other major factor that impacts an option's time value. All else remaining equal, the greater the volatility of the underlying market, the greater the option time value.

Note that time value depreciates at an increasing rate throughout the life of an option, and equals zero at option expiration. If the option has any value at expiration, it is all intrinsic value.



Option Premium Movement

Call option and put option premiums react differently when the underlying futures contract price changes. Call option premiums have a direct relationship with changes in the underlying futures contract price. As such, call premiums should increase as the underlying futures contract price increases and should decrease as the underlying futures contract price decreases. In other words, the rights to buy at the call option strike price should become more valuable as the underlying futures contract price moves higher, and decline in value as the underlying futures contract price moves lower.

Conversely, put option premiums have an inverse relationship with changes in the underlying futures contract price. As such, put premiums should increase as the underlying futures price decreases and decline as the underlying futures price increases. In other words, the rights to sell at the put option strike price should become more valuable as the underlying futures contract price moves lower, and decline in value as the underlying futures contract price moves higher.

Option Premium Movement

	CALL OPTIONS	PUT OPTION
As futures price declines	Call premium declines	Put premium increases
As futures price increases	Call premium increases	Put premium decreases

A more advanced study of option pricing would include the "Greeks." Option pricing models, such as Black-Scholes, have been developed to calculate theoretical option premiums, and "Greeks" are byproducts of those models, measuring the sensitivity of option prices to various additional factors.

For the purposes of the livestock hedger, the main Greek factor to take into consideration is the options "**Delta**," which is the change in an option premium for a given change in the underlying futures price. It is often referred to as the hedge ratio, as it indicates how many options are needed at any point in time to offset the risk of a price change in the underlying cash commodity or futures.

Other Greek factors are:

1. **Vega: option premium sensitivity to a change in volatility**
2. **Theta: the sensitivity of option premium to time decay**
3. **Gamma: the sensitivity of a change in option premium due to a change in Delta**

Although a thorough working knowledge of the Greeks is not necessary to use livestock options as an effective price risk management tool, it may be helpful to be aware of some market factors that other option traders take into consideration.

PREMIUM

Remember that premium is the most important option element that impacts the use, choice and profitability of trading options for livestock price risk management. Option buyers pay the premium and option sellers receive the premium.

Livestock Option Quotations

Livestock futures and option contracts are quoted in pounds, which can be easily converted to hundredweight, the common industry practice. For example, Live Cattle and Lean Hogs are 40,000 pound contracts, which is equivalent to 400/cwt. Feeder Cattle are 50,000 pound contracts, which is equivalent to 500 cwt.

As such, option pricing can be referenced in either cents per pound, or dollars per hundred pounds.

Examples of livestock futures and option pricing:

Lean Hog futures at 89.00 is $0.89/pound or $89.00/cwt

Live Cattle option strike price of 110 is $1.10/pound or $110.00/cwt

Feeder Cattle option premium of 1.85 is $1.85/cwt

Where Can I Find Option Premiums?

Premiums for livestock options can be acquired from a variety of sources including:

1. The CME Group website at cmegroup.com
2. Commodity brokers
3. Quote vendors
4. Newspapers

CHAPTER 6 QUIZ

1. What is conveyed in a livestock option contract?
    a. Right to either buy or sell an underlying livestock futures contract
    b. Right to either buy or sell livestock in a local cash market
    c. Obligation to either buy or sell livestock futures
    d. Obligation to either buy or sell livestock in a local cash market
2. What do you have if you buy a Live Cattle call option?
    a. Obligation to sell a Live Cattle futures contract
    b. Obligation to buy a Live Cattle futures contract
    c. Right to buy a specific Live Cattle futures contract
    d. Right to sell a specific Live Cattle futures contract
3. If you buy a Lean Hog put option, what is the cost of these rights?
    a. Strike price
    b. Futures price
    c. Commission
    d. Premium
4. What is a livestock option's strike price?
    a. A component of an option contract that doesn't change
    b. Price at which you have the rights to buy (call) or sell (put)
    c. A variety of price levels at which you have to choose from
    d. All of the above
5. What is the relationship between livestock option premiums and futures price movement?
    a. Call premiums move in the same direction as futures prices and put premiums move in the opposite direction as futures prices
    b. Call and put premiums move in the same direction as futures prices
    c. Call and put premiums move in the opposite direction as futures prices
    d. There isn't any relationship between livestock option premiums and livestock futures prices

Answers are located at the end of this publication in the Appendix.

CHAPTER 7

OPTION STRATEGIES FOR LIVESTOCK BUYERS

A buyer of physical livestock or livestock products will be impacted negatively should market prices rally. The earlier chapters of this publication covered the use of a futures contract to hedge or lock in a purchase price, thereby eliminating the risk of higher prices. However, the long futures strategy does not allow the buyer to benefit from more favorable prices should the market decline.

Some livestock option risk management strategies offer price protection similar to the long futures hedge but unlike the futures hedge, buyers will also be able to benefit from lower market prices. A key benefit of including livestock options is the flexibility they offer to price risk management plans. By using options, futures, and cash market alternatives either alone or in combination, the long hedger can eliminate, minimize or adjust their price risk exposure to a level they are comfortable with.

There are two primary option strategies for the livestock buying hedger that highlight the benefits and flexibility of using livestock options: the Long Call option strategy and the Long Call/Short Put Combination strategy.

Long Call: Establishing a "Maximum" Purchase Price

The long call strategy provides both protection against upside market risk and the opportunity to buy at a lower price if the markets decline. Hence, the long call option strategy will establish a maximum purchase price without limiting the downside potential.

The buying hedger can choose from a multitude of option strike prices, which provide different levels of risk management at varying costs (premiums). In other words, each different strike price represents a different call option and therefore will establish a different maximum purchase price.

So why don't all livestock buying hedgers use options rather than futures? It comes down to one key element of the option markets: the premium.

Long Call Maximum Purchase Price Equation

The premium of the long call needs to be factored into the results of the option strategy. Also, because the call option is being used to protect a cash market purchase, the equation must also include the basis in addition to the futures commission.

Expected Maximum Purchase Price =

Call Strike Price + Call Premium + Expected Basis + Brokerage Commission

CALL STRIKE PRICES AND OPTION PREMIUM

Remember that choosing a different strike price will result in a different option cost and therefore a different strategy result. The following example shows how different strike prices can impact the net purchase price, using an expected basis of + 5.00 (over) the futures. Commission is not included in this example.

June Live Cattle futures @ 124

120 (call strike)	+ 10.45 (premium)	+5.00 (expected basis)	= $135.45/cwt
124 (call strike)	+ 7.05 (premium)	+5.00 (expected basis)	= $136.05/cwt
130 (call strike)	+ 3.15 (premium)	+5.00 (expected basis)	= $138.15/cwt
136 (call strike)	+ 0.95 (premium)	+5.00 (expected basis)	= $141.95/cwt

The lower the call strike price, the higher the premium and the lower the maximum purchase price. However, if market prices decline, the higher strike price option which costs the least will yield the best net price for the buying hedger.

Long Call Strategy: Advantages

- Risk is limited to the cost of the premium paid for the option
- Protection against higher purchasing price levels
- Opportunity to buy at lower prices remains
- Weaker basis at the time of the livestock purchase will lower the effective buying price
- No margin requirements
- Variety of strike prices offering different levels of protection
- Hedger retains the flexibility to choose the cash market supplier of livestock and/or livestock products

Long Call Strategy: Disadvantages

- Must pay the full amount of the call option premium when the position is initiated
- Stronger basis at the time of the livestock purchase will increase the effective purchase price
- Brokerage commission must be paid

Long Call Strategy Example

A cattle buyer decides to hedge against higher prices by purchasing Live Cattle call options.

Initial Market Conditions:

- August Live Cattle futures are currently at $130.00/cwt.
- August 130 Live Cattle call option is trading at a premium of $3.15/cwt
- Expected local cash basis in late July is +5.00/cwt over the August futures

The following are three different scenarios that could occur when the cash livestock is purchased:

AUGUST LIVE CATTLE FUTURES	BASIS	CASH PRICE	130 CALL OPTION VALUE	LONG CALL GAIN/LOSS	PURCHASE PRICE = CASH PRICE –/+ OPTION GAIN/ LOSS
120.00	+5.00	$125.00	0 (expires worthless)	$3.15/Max. loss is premium paid	$128.15
130.00	+5.00	$135.00	0 (expires worthless)	$3.15/ Max. loss is premium paid	$138.15
140.00	+5.00	$145.00	$10	$6.85 gain ($10- 3.15)	$138.15

Example Notes:

1. As the risk of higher futures prices occurs, the cash purchase price will also be higher but the gain on the long call option will offset the increase in the cash market. Therefore, the net purchase in a rising market is capped at a maximum level.
2. If the market moves lower, the cash purchase price will be lower and the loss on the long call option is capped at the premium paid. Therefore, the buying hedger has the opportunity to improve their effective cash purchase price. Note that in this situation the buying hedger using a long call option will actually "lose" money on the option, while benefitting from a better (lower) net purchase price. It is important to remember that the effective net purchase price is going to determine the profitability of the livestock operation, and not whether there was a gain or loss on the option position.
3. Another factor that could impact the results of the long call option strategy is if the basis is different than expected at the time of the cash market purchase. If it is weaker (e.g., +3.00) the net purchase price will be lower and if it is stronger (e.g., 8.00, the net purchase price will be higher.
4. The long call option strategy also allows the buying hedger to choose the cash market supplier, which is usually the cash market participant offering the best cash price, or in other words, the best basis.

Long Call/Short Put Combination – Establishing a Purchase Price Range

There could be a variety of reasons why a livestock buyer would want to establish a purchase price range by simultaneously buying a call option and selling a put option. The most obvious reason is that this strategy provides yet another alternative to manage the risk of higher prices in the local cash market. Another reason is that the premium collected by selling the put option effectively lowers the cost of the upside protection provided by purchasing a call option. However, selling the put option not only lowers the *maximum* purchase price set by the call, it also establishes a *minimum* (or floor) purchase price. In other words, the opportunity for a lower purchase price is limited with the sale of the put option. As such, buying hedgers will usually choose to sell an out-of-the money put option.

The difference between the call strike price and the put strike price will determine the purchase price range. There are many call and put option strike prices that a buying hedger can choose from, allowing them to effectively determine the parameters of their buying price range.

Long Call/Short Put Combination: Purchase Price Range Calculations

Unlike the long futures or long call option strategies that each require a single calculation, the Long Call/Short Put Combination strategy requires two calculations: one determines the maximum (ceiling) price of the range and the other determines the minimum (floor) price. The call premium paid and the put premium collected are factored into the results of the strategy. Also, because the call and put options are being used to protect a cash market purchase, the calculation must also include the basis in addition to the brokerage commission.

Long Call/Short Put Combination:
Expected Maximum Purchase Price = Call Strike Price + Call Premium – Put Premium + Expected Basis + Brokerage Commission

Long Call/Short Put Combination:
Expected Minimum Purchase Price = Put Strike Price + Call Premium – Put Premium + Expected Basis + Brokerage Commission

LONG CALL/SHORT PUT STRIKES

Options with different strike prices will also have different premiums, which will result in different purchase price ranges. Although the objective of selling a put in combination with the call option is to lower the cost of the upside market risk, the short put also establishes a minimum purchase price. In other words, the long hedger's downside opportunity is limited.

Long Call/Short Put Combination Strategy: Advantages

- Put premium received reduces cost of price protection
- Retain some opportunity for lower purchase prices
- Weaker basis at the time of the livestock purchase will lower the effective buying price
- No margin on the call option
- Variety of strike prices offers different purchase price ranges
- Hedger retains the flexibility to choose the cash market supplier of livestock and/or livestock products

Long Call/Short Put Combination Strategy: Disadvantages

- Must pay the full amount of the call option when the position is initiated
- Establishes a minimum purchase price
- Margin required on the short put option
- Short put option may be exercised earlier than expected
- Stronger basis at the time of the livestock purchase will increase the effective purchase price
- Brokerage commission must be paid for the call and put option

Long Call/Short Put Combination Strategy Example

A cattle buyer decides to hedge against higher prices and establish a purchase price range by buying Live Cattle call options and selling Live Cattle put options.

Initial Market Conditions:

- June Live Cattle futures are currently at $130.00/cwt.
- June 130 Live Cattle call option is trading at a premium of $3.15/cwt
- June 124 Live Cattle put option is trading at a premium of $1.35/cwt
- Expected local cash basis in late May is +5.00/cwt over the May futures

The following are three different scenarios that could occur when the cash livestock is purchased:

JUNE LIVE CATTLE FUTURES	BASIS	CASH PRICE	130 CALL OPTION VALUE 124 PUT OPTION VALUE	LONG CALL RESULT SHORT PUT RESULT NET OPTION RESULT	PURCHASE PRICE = CASH PRICE –/+ OPTION GAIN/ LOSS
120.00	+5.00	$125.00	Call Value = $0 Put Value = $4	Long Call: $3.15 loss Short Put: $2.65 loss Net Result: $5.80 loss	$130.80
130.00	+5.00	$135.00	Call Value = $0 Put Value = $0	Long Call: $3.15 loss Short Put: $1.35 gain Net Result: $1.80 loss	$136.80
140.00	+5.00	$145.00	Call Value = $10 Put Value = $0	Long Call: $6.85 gain Short Put: $1.35 gain Net Result: $8.20 gain	$136.80

Example Notes:

1. As the risk of higher futures market prices occurs, the cash purchase price will also be higher, but the gain on the long call option and the short put option will offset the increase in the cash market. Therefore, the net purchase price in a rising market is capped at a maximum level. This is a lower maximum price level than that of the earlier Long Call strategy; the amount of premium collected for also selling the put is the difference in the lower maximum price.

2. If the market moves lower, the cash purchase price will be lower. However, the hedger will experience a maximum loss of the premium paid on the long call component of the strategy, and increasing losses on the short put option component. Therefore, unlike the Long Call strategy, the opportunity for a lower net purchase price in a falling market is limited because of the short option position.

3. The effective price range is determined by the difference in the call and put option strike prices. In the above example, the price range of $6 was determined by the difference in the call strike price (130) and the put strike price (124). Depending on the risk level a long hedger is willing to assume, the purchase price range established by this strategy could vary by choosing different strike prices.

4. Another factor that could impact the results of the Long Call/Short Put Combination strategy is if the basis is different than expected at the time of the cash market purchase. If it is weaker (e.g., +3.00) the net purchase price will be lower and if it is stronger (e.g., 8.00), the net purchase price will be higher. Also, the scenarios assumed there is no time value left at the expiration of the strategy. If there is time value remaining, it will impact the effective purchase price.

5. The Long Call/Short Put Combination strategy also allows the buying hedger to choose the cash market supplier, which is usually the one offering the best cash price, or in other words, the best (weakest) basis.

Long Hedger Highlights

This booklet has illustrated three different ways that a livestock or livestock product buyer can use futures or options to manage the risk of higher market prices.

- The Long Futures strategy establishes a "purchase price level" regardless of whether the market risk occurs (higher prices) or does not occur (lower prices).
- The Long Call strategy establishes a "maximum purchase price level" which provides protection if the market risk occurs, but also the opportunity for a lower price if the market declines.
- The Long Call/Short Put Combination strategy establishes a purchase price "range", which is determined by the difference in the call and put strike prices.

These three strategies are just a few of the numerous alternatives that are available to manage the livestock buyer's price risk by using futures, options and combinations of contracts. They provide the livestock buying hedger with the flexibility to adjust their market risk exposure to a level that they are willing to assume. A livestock buyer may want to contact their broker, market advisor or state livestock marketing specialist to discuss additional strategies to manage their risk.

CHAPTER 7 QUIZ

1. What market risks does a buyer of livestock face?

   a. Lower prices and weaker basis

   b. Higher prices and stronger basis

   c. Higher prices and weaker basis

   d. Lower prices and stronger basis

2. What is a basic option position for a buyer of livestock?

   a. Long put option

   b. Short call option

   c. Long call option

   d. Short futures

3. What combination of option positions establishes a livestock buying range?

   a. Long call and long put

   b. Short call and long put

   c. Long call and short put

   d. Short call and short put

4. What are the benefits of a long call strategy for livestock buyers?

   a. No margin requirements

   b. Protection against higher prices

   c. Opportunity if prices move lower

   d. All of the above

5. What can impact the final results of a long call strategy for a livestock buying hedger?

   a. A change in the basis

   b. A change in the underlying futures price

   c. Commission on the option

   d. All the above

Answers are located in the Appendix.

CHAPTER 8

OPTION STRATEGIES FOR LIVESTOCK SELLERS

Remember that the selling hedger has downside market risk. That is, the profitability of a livestock or livestock product seller will be impacted negatively should market prices fall. The early chapters covered the use of a futures contract to hedge or lock in a selling price, thereby eliminating the risk of lower prices. However, the short futures strategy does not allow the selling hedger to benefit from more favorable prices should market prices increase.

Livestock options are another tool to manage the downside price risk associated with selling livestock and/or livestock products. Some of the option strategies will provide downside price protection similar to the short futures hedge but unlike the short futures hedge, livestock sellers will also be able to benefit from higher market prices. A key benefit of adding livestock options to a portfolio is the flexibility that is added to price risk management plans. By using options, futures and cash market alternatives either alone or in combination, the short hedger can eliminate, minimize or adjust their price risk exposure to a level they are comfortable with.

Two of the primary option strategies that highlight the benefits and flexibility of using livestock options to protect a selling price are the Long Put option, and Long Put/Short Call Combination strategy.

Long Put: Establishing a "Minimum" Selling Price

Similar to the short futures hedge, a long put option strategy will provide price protection against lower prices but unlike the short futures hedge, the long put strategy also provides additional opportunity for a more favorable selling price should the market move higher. Hence, the long put option strategy will establish a minimum selling price while not limiting the upside potential.

The selling hedger can choose from a multitude of put option strike prices, which provide different levels of risk management at different costs. In other words, each strike price represents a different put option and therefore, will establish a different minimum selling price.

So why don't all livestock selling hedgers use the put option market rather than short futures if the put provides both price protection and opportunity? Again, it comes down to one key element of the option markets: premium.

Long Put Minimum Selling Price Equation

The cost of the long put option needs to be factored into the strategy results. Also, because the put option is being used to protect a cash market sale, the equation must also include the basis, in addition to the brokerage commission.

Expected Minimum Selling Price =

Put Strike Price - Put Premium + Expected Basis - Brokerage Commission

PUT STRIKE PRICES AND OPTION PREMIUM

Remember that choosing a different strike price will result in a different option cost and therefore a different result of the strategy. The following examples shows how different put strike prices can impact the net selling price, using an expected basis of - 6.00 (under). Commission is not included in this example.

May Lean Hog Futures @ 96.00

102 (put strike)	– 8.85 (premium)	– 6.00 (expected basis)	= $87.15/cwt
96 (put strike)	– 4.90 (premium)	– 6.00 (expected basis)	= $85.10/cwt
90 (put strike)	– 2.80 (premium)	– 6.00 (expected basis)	= $81.20/cwt
86 (put strike)	– 1.25 (premium)	– 6.00 (expected basis)	= $78.75/cwt

The higher the put strike price, the higher the premium, but the resulting minimum selling price is also higher. However, should market prices rally, the lower strike price put option which cost the least will yield the best net selling price for the hedger.

Long Put Strategy: Advantages

- Risk is limited to the cost of the premium paid for the option
- Protection against the risk of lower price levels
- Opportunity for higher prices remains
- Stronger basis at the time of the actual livestock sale will raise the effective selling price
- No margin requirements
- Variety of strike prices offering different levels of protection
- Short hedger retains the flexibility to choose the cash market buyer

Long Put Strategy: Disadvantages

- Must pay the full amount of the put option premium when the position is initiated
- Weaker basis at the time of the livestock sale will lower the effective selling price
- Brokerage commission must be paid

Long Put Strategy Example

A hog producer decides to hedge against falling prices by selling Lean Hog put options.

Initial Market Conditions:

- April Lean Hog futures are currently at $96.00/cwt.
- April 96 Lean Hog put option is trading at a premium of $4.90/cwt
- Expected local cash basis in early April is – 6.00/cwt (under) the April futures

The following are three different scenarios that could occur when the cash livestock is sold:

APRIL LEAN HOG FUTURES	BASIS	CASH PRICE	96 PUT OPTION VALUE	LONG PUT PROFIT/LOSS	SELLING PRICE = CASH PRICE +/– OPTION GAIN/LOSS
80.00	- 6.00	$74.00	$16/cwt	$11.10/gain	$85.10
96.00	- 6.00	$90.00	0 (expires worthless)	$4.90/max. loss	$85.10
112.00	- 6.00	$106.00	0 (expires worthless)	$4.90/max. loss	$101.10

Example Notes:

1. As the risk of lower futures prices occurs, the cash selling price will also be lower but the gain on the long put option will offset the decline in the cash market. Therefore, the net sale price in a falling market is set at a minimum level.

2. If the market moves higher, the cash selling price will also be higher and the loss on the long put option is capped at the premium paid. Therefore, in a rising market the short livestock hedger has the opportunity to improve their effective cash selling price. Note that in this situation, the selling hedger using a long put option will actually "lose" money on the option, while benefitting from a better (higher) net selling price. It is important to remember that the effective net selling price (combined results of the cash market and put option positions) is going to determine the profitability of the livestock operation, and not whether there was a profit or loss on the put option position.

3. Another factor that could impact the results of the long put option strategy is if the basis is different than expected at the time of the cash market sale. If it is stronger (e.g., - 3.00) the net selling price will be higher and if it is weaker (e.g., - 8.00, the net selling price will be lower.

4. The long put option strategy also allows the selling hedger to choose the cash market buyer, which is usually the livestock buyer offering the best cash price, or in other words, the best (strongest) basis.

Long Put/Short Call Combination: Establishing a Selling Price Range

There could be a variety of reasons why a livestock selling hedger would want to establish a selling price range. The most obvious reason is that the Long Put/Short Call strategy provides yet another way to manage the risk of lower prices in the local cash market, with the premium collected by selling the call option effectively lowering the cost of the downside price risk management provided by purchasing the put. However, by selling the call option, not only is the minimum selling price set by the long put increased, there is also a maximum (or ceiling) selling price established. In other words, the opportunity for a higher selling price is limited with the sale of the call option. As such, selling hedgers will usually choose to sell an out-of-the money call option.

The difference between the put strike price and the call strike price will determine the selling price range. There are many put and call option strike prices that a selling hedger can choose from, allowing them to effectively determine the parameters, or width of their selling price range. This is another risk management alternative that provides flexibility for the short hedger.

Long Put/Short Call Combination: Selling Price Range Calculations

Unlike the short futures or long put option strategy that each require a single calculation, the Long Put/Short Call Combination requires two calculations: one calculation to determine the minimum (floor) selling price of the range and the other to determine the maximum (ceiling) selling price. The put premium paid and the call premium collected are factored into the results of the strategy. Also, because the call and put options are being used to protect a cash market purchase, the equation must also include the concept of basis, in addition to the brokerage commission.

Long Put/Short Call Combination:
Expected Minimum Selling Price = Put Strike Price – Put Premium + Call Premium + Expected Basis – Brokerage Commission

Long Put/Short Call Combination:
Expected Maximum Selling Price = Call Strike Price – Put Premium + Call Premium + Expected Basis – Brokerage Commission

LONG PUT/SHORT CALL STRIKES

Put options with different strike prices will also have different premiums, which will result in different selling price ranges. Although the objective of the Short Call in combination with the Long Put option is to lower the cost of the downside market risk protection, the short call establishes a maximum selling price. In other words, the short hedger's upside opportunity is limited.

Long Put/Short Call Combination Strategy: Advantages

- Call premium received reduces cost of price protection
- Retain some opportunity for higher selling prices
- Stronger basis at the time of the livestock sale will increase the effective selling price
- No margin on the long put option position
- Variety of strike prices offer different selling price ranges
- Short hedger retains the flexibility to choose the cash market livestock buyer

Long Put/Short Call Combination Strategy: Disadvantages

- Must pay the full amount of the put option premium when the position is initiated
- Establishes a maximum selling price
- Margin is required on the short call option
- Short call option position may be exercised earlier than expected
- Weaker basis at the time of the livestock sale will lower the effective selling price
- Brokerage commission must be paid for the call and put option

Long Put/Short Call Combination Strategy Example

A hog producer decides to hedge against lower prices and establish a selling price range by buying Lean Hog put options and selling Lean Hog call options.

Initial Market Conditions:

- April Lean Hog futures are currently at $96.00/cwt.
- April 96 Lean Hog put option is trading at a premium of $4.90/cwt
- April 102 Lean Hog call option is trading at a premium of $2.60/cwt
- Expected local cash basis in early April is 6.00/cwt under the April futures

The following are three different scenarios for when the cash hogs are sold:

APRIL LEAN HOG FUTURES	BASIS	CASH PRICE	96 PUT OPTION VALUE/ 102 CALL OPTION VALUE	LONG PUT RESULTS SHORT CALL RESULTS NET RESULT	SELLING PRICE = CASH PRICE +/– OPTION GAIN/LOSS
86.00	- 6.00	$80.00	Put Value = $10 Call Value = $0	Long Put: $5.10 gain Short Call: $2.60 gain Net Gain: $7.70	$87.70
96.00	- 6.00	$90.00	Put Value = $0 Call Value = $0	Long Put: $4.90 loss Short Call: $2.60 gain Net Loss: $2.30	$87.70
106.00	- 6.00	$100.00	Put Value = $0 Call Value = $4	Long Put: $4.90 loss Short Call: $1.40 loss Net Loss: $6.30	$93.70

Example Notes:

1. As the risk of lower market prices occurs, the cash sale price will also be lower, but the gain on the Long Put / Short Call Combination strategy will offset the lower cash market selling price. Therefore, the net selling price in a falling market is protected at a minimum level. This is a higher minimum selling price than that established by the earlier Long Put strategy. The amount of premium collected for selling the call option is the difference in the higher minimum price.

2. If the market moves higher, the cash selling price will be higher. However, the hedger will experience a maximum loss of the premium he paid on the long put component of the strategy, and increasing losses on the short call component. Therefore, unlike the Long Put strategy, the opportunity for a higher net selling price in a rising market is capped because of the short call option position.

3. The effective selling price range is determined by the difference in the put and call option strike prices. In the example, the price range of $6 was determined by the difference of the put strike price (96) and the call strike price (102). Depending on the amount of risk a short hedger is willing to assume, the hedger could adjust the selling price range by choosing different strike prices.

4. Another factor that could impact the results of the Long Put / Short Call Combination strategy is if the basis is different than expected at the time of the cash market sale. If it is stronger than expected (e.g., -2.00) the net selling price will be higher and if it is weaker (e.g., -9.00), the net selling price will be lower. The scenarios in the example assume there is no time value left at expiration of the options. If there is time value remaining, it will impact the effective selling price.

5. The Long Put / Short Call Combination strategy also allows the selling hedger to choose the cash market buyer, who is usually the buyer who bids the best cash price, or in other words, the best (strongest) basis.

Short Hedger Highlights

This booklet has illustrated three different ways a seller of livestock or livestock products can use futures or options to manage the risk of lower market prices.

- The short futures strategy establishes a "selling price level" regardless if the market risk occurs (lower prices) or does not occur (higher prices).
- The Long Put strategy establishes a "minimum selling price level" which provides protection if the market risk of lower prices occurs, but also the opportunity for a better selling price if the market moves higher.
- The Long Put / Short Call Combination strategy establishes a selling price "range", which is determined by the difference in the put and call strike prices.

These three strategies are just a few of the numerous strategies that are available to manage the selling hedger's price risk by using futures, options and combinations of contracts. These strategies provide the livestock selling hedger with the flexibility to adjust their market risk exposure to a level that they are willing to assume. A livestock seller may want to contact their commodity broker, market advisor or their state livestock marketing specialist to discuss additional strategies to manage their risk.

CHAPTER 8 QUIZ

1. What market risks does a seller of livestock face?

   a. Lower prices and weaker basis

   b. Higher prices and stronger basis

   c. Higher prices and weaker basis

   d. Lower prices and stronger basis

2. What is a basic option position for a seller of livestock?

   a. Long put option

   b. Short call option

   c. Long call option

   d. Short futures

3. What combination of option positions establishes a livestock selling range?

   a. Long put and short call

   b. Short call and short put

   c. Long call and short put

   d. Long call and long put

4. What are the benefits of a Long Put strategy for livestock sellers?

   a. No margin requirements

   b. Protection against lower prices

   c. Opportunity if prices move higher

   d. All of the above

5. What can impact the final results of a Long Put strategy for a livestock seller?

   a. A change in the basis

   b. A change in the underlying futures price

   c. Commission on the option

   d. All the above

Answers are located in the Appendix.

CHAPTER 9

KEYS TO SUCCESSFUL LIVESTOCK RISK MANAGEMENT

For both livestock buyers and livestock sellers, the following are keys to successful risk management.

1. **Develop a team:** When it comes to risk management, a team approach may work best. This applies to individual operations, family operations or corporate entities. Family or corporate operations may find it easier to follow this key to success, but an individual can also develop a team by working with friends or family in similar situations.

2. **Consult with advisors:** Advisors may be especially helpful when a livestock hedger is first getting started in the futures and options markets. There are different types of advisors that charge different fees. These include commodity brokers, commodity consultants, universities, state livestock marketing specialists and USDA staff. If a hedger feels they do not have the time or expertise to devote to the important function of risk management, they should feel comfortable getting professional assistance and guidance from those who specialize in this field.

3. **Learn the alternatives:** Whether or not the hedger consults with an advisor, they should learn about all the alternatives for managing the risk associated with purchasing or selling livestock. Even when consulting with an advisor, the hedger should make the final decisions as it is their business that is at risk.

4. **Develop a hedging policy:** A hedging policy could range from a very basic set of rules for the individual or family livestock operation, to a complex legal document for a corporate hedging operation. Regardless, it may be important to have some form of written document to keep decisions within a specific set of trading rules.

5. **Develop a plan:** Whereas a hedging policy is more or less a permanent document with general rules of trading, a plan pertains to a specific time period or for a specific livestock sale or purchase that may occur in the near future. A written plan will help the livestock hedger stick to their risk management goals and objectives. It will include decisions such as which risk management tool to use, pricing objectives and timing. A livestock hedger can develop a different plan for each year, or for each individual purchase or sale due to different market conditions, such as price levels and market volatility.

6. **Get management buy-in:** Management approval comes in different forms depending on the size of the operation. It can range from a simple nod of acceptance by a spouse or other family member, to a signed legal approval on a formal corporate plan.

Regardless, if there are others that are impacted by the decisions, they should at least be aware of the risk management plans and sign off on them at some level. Especially with larger livestock operations, it is important that others in management are comfortable with the objectives and the plan to achieve them.

7. **Have the discipline to stay with the plan, but flexibility to adjust:** Depending on changes in the market environment during the course of a hedging plan, this key may require a difficult combination of discipline and flexibility. If there are minor changes in market conditions that appear to be moving against the hedger, he needs discipline to stick with the plan. However, on occasion, due to major unexpected market conditions, it may be appropriate to make adjustments to the initial plan. One of the worse things a hedger can do is to make continuous changes in the plan for every little market hiccup. This could lead to a negative situation called being "whipsawed."

8. **Keep good records:** Record keeping is an often overlooked task requiring a minimal amount of time, but it is essential to good risk management for livestock buyers and sellers. It could be as simple as keeping records on paper, to more advanced computer spreadsheets. Hedgers should keep track of the futures and cash market prices, as well as their local basis. Additionally, they must keep track of the risk management strategies used and the resulting profits and losses. Good records will assist in tax preparation and future risk management plans.

9. **Review the results:** A thorough analysis of the risk management strategies and overall plan is necessary to determine what worked, what didn't work and most importantly, why? Similar to keeping good records, reviewing results—both positive and negative—will help a livestock buyer or seller become a more effective hedger in the future.

10. **Don't look back:** Simply stated, this means to learn from past experiences and realize not all experiences are going to be positive, but not become fixated on the negative. A livestock hedger may actually learn more from a negative experience than a positive one. Remember that everyone has 20-20 hindsight vision and it is then easy to look back and complain about what should have been done. However, the successful livestock hedger will use past experiences to move forward in a positive manner.

CHAPTER 9 QUIZ

1. When may it be a good time for a livestock hedger to adjust their risk management plan?

   a. Never

   b. Whenever the market moves slightly against you

   c. When global market conditions change significantly from initial expectations

   d. Always when your advisor tells you to change

2. Who should make the final decisions when developing and executing a risk management plan?

   a. Management team

   b. Spouse

   c. Advisor

   d. You, the hedger

3. What are some valid reasons for keeping good records

   a. Tax returns

   b. Using historical basis information for future risk management decisions

   c. Identify potential market price trends that could influence future decisions

   d. All the above

4. Why is a written risk management plan important?

   a. Makes it more difficult to forget or change at random

   b. The CFTC and Exchange will need a copy

   c. The Internal Revenue service requires a plan

   d. May be helpful when reviewing and/or defending the plan to your management

   e. Both A and D

5. What risk management strategies should a good livestock hedger learn?

   a. Futures contract strategies

   b. Option contract strategies

   c. Cash market alternatives

   d. Government programs

   e. All of the above and any other new risk management methods

Answers are located at the end of this publication in the Appendix.

CHAPTER 10

ADDITIONAL RISKS OF THE LIVESTOCK HEDGER

This guide focused on how Livestock hedgers can manage the price risks associated with buying and selling livestock and livestock products. There are many other risks that a livestock operation is exposed to, and the same concepts of managing livestock risk can also be applied to other price risks that these operations may face.

For livestock producers, another critical price risk is the cost of feed. As the prices and production of grain and oilseed crops are impacted by various factors, it will in turn affect the cost and profitability of producing livestock. CME Group grain and oilseed products, including corn, wheat, soybean meal and oats futures and options, can be used as feed risk management tools. The following example provides a simple illustration.

Feed Hedging Example

A livestock producer plans to buy corn in November to meet his feed requirements. The current cash market price in July for corn to be delivered in November is $6.50 per bushel. He is concerned that the cash price may be much higher when he needs to purchase the physical corn. To protect against a possible price increase, the livestock producer buys December Corn futures at $6.50 per bushel.

DATE	CASH MARKET	FUTURES MARKET
July	Cash Corn is $6.50 per bushel	Buy December Corn futures at $6.50 per bushel
November	Buy cash Corn at $7.00 per bushel	Sell December Corn futures at $7.00 per bushel
Change	$.50 per bushel loss	$.50 per bushel gain
Results	Buy cash corn $7.00 Gain on futures position -.50 Net purchase price $6.50	

Nearly every livestock business consumes energy, which could have a major impact on a firm's bottom line. At times, the energy markets may be quite volatile. Regardless of the types of energy consumed--gasoline, natural gas, heating oil, diesel fuel, crude oil or others-- CME Group has a variety of Energy futures and options products available to help manage these risks.

Depending on the size of the livestock related business, the financial portfolio or the ability to borrow to fund operations may be at risk to changing interest rates. Whether the hedger has short or long term interest rate exposure, the CME Group financial products, such as Eurodollars and U.S. Treasury futures and options, can help minimize the risks of fluctuating interest rates.

If a business is buying or selling livestock or livestock products outside their own borders, fluctuating foreign currency values (i.e., FX risk) may also have an impact on the firm's bottom line. CME Group FX products can help manage these market exposures, including Mexican Peso, British Pound, Canadian Dollar, Japanese Yen, Euro Currency, Australian Dollar and many others.

A commodity broker or advisor will be able to advise livestock hedgers on structuring strategies to address the various risks they face.

CHAPTER 10 QUIZ

1. What types of market risk does a Livestock producer have?
    a. Livestock prices
    b. Energy costs
    c. Feed costs
    d. Interest rates
    e. All of the above
2. If a livestock hedger is buying or selling livestock or livestock products to or from another country, what are some of the market risks they have?
    a. Livestock prices
    b. Foreign Currency Exchange Rates
    c. A and B
    d. No market risk
3. What impact would higher feed prices and higher energy prices have on a livestock operation?
    a. Lowers profitability
    b. Raises profitability
    c. No impact on profitability
4. Which of the following is the most basic hedging strategy to protect from higher feed and energy costs
    a. Long put
    b. Short call
    c. Long futures
    d. Short futures
5. What does a long call do for a livestock hedger who uses feed and energy?
    a. Provides price protection against higher feed and energy costs
    b. Provides opportunity for lower feed and energy costs
    c. Not a valid strategy for feed and energy
    d. A and B

SUMMARY

One of the main objectives of this publication was to provide a good general understanding of the futures industry and how livestock futures and option contracts could be used to protect hedgers against adverse price moves. However, the primary goal was to highlight the overall importance of price risk management, using whatever alternatives are available to manage risk. As such, this booklet should be used by livestock hedgers as a stepping stone to continue their education and training.

CME Group Livestock futures and options markets offer many benefits for buyers and sellers of livestock products who are looking to manage their price risk. These include:

- Variety of products and services to help manage all aspects of business related risks, including production, feed, energy, currency and interest rates
- Flexibility to adjust risk exposure to a level of their choice
- Liquidity that provides the hedger with efficient entry and exit of their market positions
- Transparency of two trading platforms providing openly available market information
- Regulations that provide orderly trading rules for all market participants
- Financial integrity of CME Clearing behind all transactions

APPENDIX

Getting Started

The selection of a Futures Commission Merchant (FCM) or commodity broker to assist with a hedger's trading needs should not be taken lightly. One of the first steps to take when considering a commodity broker is to ensure they are registered with the National Futures Association (NFA).

There are two general types of brokers: Full Service and Discount brokers. The difference is in the amount of service beyond trade execution that is offered. If the hedger is relatively new to risk management, they may prefer to pay a relatively higher commission for a Full Service broker's additional trading advice and consultation. A more experienced trader may prefer a Discount broker solely for their execution function, and forego additional consulting services for a relatively lower commission. Regardless of the type, the execution of the trades should be similar.

One of the best ways to select a commodity broker for hedging purposes is word of mouth. Check with neighbors or livestock industry colleagues to get their opinions or referrals. The "Find a Broker" page on the CME Group website also provides a list of commodity brokers and their services.

In addition to brokers, a hedger may also seek the services of a hedging consultant or advisor. The hedger must make sure that their broker and/or consultant is fully aware of their business operation and their risk management objectives.

Additional Resources

There are numerous books and periodicals that focus on livestock risk management alternatives. The CME Group website has a considerable amount of information on the agricultural markets, including price quotes, market commentary, educational publications, webinars and tutorials. Other resources are state livestock marketing specialists, usually found at the state land grant universities.

Regardless of how information is obtained on the livestock markets, it is imperative to continue learning about this invaluable subject of price risk management.

Chapter Quiz Answer Key

Chapter 1:
1.d 2.c 3.e 4.a 5.c 6.c 7.b 8.c

Chapter 2:
1.c 2.a 3.c 4.c 5.d

Chapter 3:
1.c 2.c 3.b 4.b 5.c

Chapter 4:
1.c 2.c 3.d 4.d 5.d

Chapter 5:
1.d 2.a 3.d 4.d 5.d

Chapter 6:
1.a 2.c 3.d 4.d 5.a

Chapter 7:
1.b 2.c 3.c 4.d 5.d

Chapter 8:
1.a 2.a 3.a 4.d 5.d

Chapter 9:
1.c 2.d 3.d 4.e 5.e

Chapter 10:
1.e 2. c 3.a 4.c 5.d

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