



# CBOT® Agricultural Futures & Options

## MANAGING HOG FEED COSTS

**H**og operations have market risks associated with their feed costs and livestock sales. Whether you are in charge of a corporate hog facility or your own farm, managing these price risks should be a priority for the pork industry. Although many managers are concerned only about revenue from hog sales, smart managers will focus on the bottom line and specifically the line items that have a major impact on it—feed costs. Market risks associated with feed include two components: price and basis. Price levels are discovered via the Chicago Board of Trade (CBOT®) Corn and Soybean Meal futures markets. Basis is the relationship between a local cash market feed price and the related CBOT futures price.

A rally in Corn futures prices or a strengthening basis can be just as financially devastating to a livestock operation as low pork prices. Fortunately, there are many alternatives to manage market risk associated with feed costs. Some of these alternatives are available from a local feed manufacturer/supplier and others are available through the futures markets at the Chicago Board of Trade.

This paper focuses on two common feed strategies using Corn futures and options: Long Futures Hedge and Long Call Hedge. The same strategies could be used to manage soybean meal costs.

### Long Futures Hedge

The Long Futures Hedge is one of the most basic risk management strategies for locking in feed costs. A long position in CBOT Corn futures is initiated as a temporary substitute for the eventual purchase of feed from a feed supplier/manufacturer. The long futures position can be placed well in advance of your feed requirements and will provide price protection until the feed corn is actually purchased.

Immediately upon the purchase of the feed corn, the long Corn futures position should be closed out (offset). Since prices in the cash market and futures market move up and down together over time, a loss in either one of these markets will be offset by a gain in the other—thus allowing the hog operation to lock in (establish) a corn price level in advance of the actual feed corn purchase.

### Advantages

- Eliminates risk of higher price levels
- Establishes a buying price level in advance of the feed purchase
- Helps with planning and budget process
- Weakening basis improves the effective feed buying price
- Futures position guaranteed by the CBOT margin process

### Disadvantages

- Strengthening basis increases effective feed buying price
- Lose potential to buy at a more favorable price level if markets move lower
- Transaction costs

### *Evaluation of a Long Futures Hedge*

$$\begin{array}{r} \text{Long Futures Price} \\ +/\text{- Expected Basis*} \\ \hline \text{Expected Buying Price} \end{array}$$

(\*Basis at time of cash market purchase)

### Long Futures Hedge Example: Assumptions

Buy (long) July Corn Futures	\$2.40/bushel
Expected Basis for June	+ .25/bu
Expected Buying Price	\$2.65/bu

### June Scenario 1: Rising Prices

Sell (offset) July Corn Futures	\$3.05/bu
Basis	+ .25/bu
Local feed corn price	3.30/bu
Futures Profit*	- .65/bu
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Effective Feed Purchase Price	\$2.65/bu

### June Scenario 2: Falling Prices

Sell (offset) July Corn Futures	\$2.00/bu
Basis	+ .25/bu
Local feed corn price	2.25/bu
Futures Loss**	+ .40/bu
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Effective Feed Purchase Price	\$2.65/bu

\*(Buy at \$2.40/bu and sell at \$3.05/bu)

\*\* (Buy at \$2.40/bu and sell at \$2.00/bu)

### Long Futures Strategy Notes

As prices moved higher in Scenario 1, the higher feed corn price was offset by a gain on the long futures position. Without the long futures hedge, the actual purchase price would have been \$.65/bu higher at \$3.30/bushel. As prices moved lower in Scenario 2, the loss on the long futures position was offset by the lower feed corn price. In both scenarios, the effective feed purchase price was the same (\$2.65/bu) because the basis did not change.

If the basis had changed, the results would have been different. A weaker basis in June (e.g., +\$.10/bu) would have lowered the effective purchase price by \$.15/bu to \$2.50/bushel. Whereas, a stronger basis in June (e.g., +\$.35/bu) would have increased the effective purchase price by \$.10/bu to \$2.75/bushel.

The Long Futures Hedge locks in a buying price level in advance of the feed grain purchase. Since basis changes have a direct impact on the hedging results, a good understanding of local basis and seasonality will be helpful in deciding if and when to use this strategy. Also, when evaluating futures or option strategies, you should include the transaction costs.

## Long Call Option Hedge

With the advent of commodity options, a whole new world of risk management strategies opened for the agricultural community, including the pork industry. The long Corn Call option position provides the right (but not the obligation) to buy a specific Corn futures contract at a specific price level (strike price). If prices rise above the strike price level, the hog operation manager (buyer of the call option) has the right to buy Corn futures at the strike price level. Should the Corn futures price fall below the strike price level, the manager is not obligated to the call option strike price, and therefore, can buy their feed corn based off the currently lower price level.

The long call option position eliminates upside price level risk while allowing the hog operation manager to buy feed at a lower price level if the markets move lower. In addition to the price level, the basis level will affect the actual buying price at the time that the feed corn is purchased, just as it did with the Long Futures Hedge. A weaker basis at the time of the feed corn purchase improves the buying price while a stronger basis will increase the actual buying price.

### Advantages

- Eliminates risk of higher price level
- Establishes a maximum buying price level
- Benefits from a lower price level
- Weaker basis improves buying price level
- No margin requirements (option buyers do not post margin)
- Option position guaranteed by the CBOT margin process (option sellers post margin)
- Assists with planning and budget process

### Disadvantages

- Stronger basis increases buying price
- Premium is paid in full at time of call option purchase
- Transaction costs

### Evaluation

$$\begin{array}{r} \text{Call Strike} \\ + \text{ Premium} \\ +/- \text{ Basis*} \\ \hline \text{Expected Maximum (Ceiling) Buying Price} \end{array}$$

(\*Basis at time of cash market purchase)

### Long Call Option Hedge Example: Assumptions

Buy 2.40 July Corn Call Option for \$.15/bushel (premium)

Expected basis for early June: +.25/bu

Expected maximum (ceiling) buying price:

$\$2.40 + .15 + .25 = \$2.80/\text{bushel}$

### June Scenario 1: Rising Prices

2.40 July Call Option Premium	\$ .65/bu
July Corn Futures	\$3.05/bu
Basis	+ .25
Local Feed Corn Price	3.30
Call Option Profit*	- .50
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Effective Purchase Price	\$2.80/bu

### June Scenario 2: Falling Prices

2.40 July Call Option Premium	\$0.00/bu
July Futures	\$2.00/bu
Basis	+ .25
Local Feed Corn Price	2.25
Call Option Loss**	+ .15
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Effective Purchase Price	\$2.40

\*(Buy call at \$0.15 and sell (offset) call at \$0.65/bu)

\*\* (Buy call at \$0.15 and call expires worthless)

The Long Call Option Hedge **establishes a maximum (ceiling) purchase price** level and retains the downside 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, higher feed prices), but they are better off if they don't have to rely on the coverage (in this case, lower feed prices).

### Conclusion

The Long Futures Hedge and the Long Call Option Hedge are only two of the many risk management alternatives available by using Chicago Board of Trade agricultural futures and options including Corn, Wheat, Soybeans, Soybean Meal, Soybean Oil, Oats, and Rice. The *flexibility and integrity* of CBOT futures and options allows the pork industry to adjust their market risk exposure to any level with which they are comfortable.

For more information on risk management strategies for the hog industry, contact your broker or a CBOT product manager at 312-341-7955. For more information on the CBOT agricultural complex, visit [www.cbot.com](http://www.cbot.com).

### Long Call Option Strategy Notes

As prices rallied in Scenario 1, the higher cash market price for feed was offset by a profit on the long call option position and the maximum (ceiling) purchase price was achieved. If prices would have moved even higher, the call option profit would have been greater, providing additional protection against the higher feed corn prices in the cash market. Regardless of how high prices move, the maximum buying price would be achieved. As prices declined in Scenario 2, the call option loses value but the feed corn costs decreased. Although the feed costs will continue to improve as market prices move lower, the call option loss is limited to the initial premium paid (\$0.15/bu). Therefore, the effective purchase price for feed corn will continue to improve as price levels move lower. Basis will have the same impact on the Long Call Option Hedge as it did with the Long Futures Hedge.

## CBOT Corn Futures Contract Specifications

<b>Contract Size</b>	5,000 bushels (bu)*
<b>Price Quote</b>	cents/bu
<b>Tick Size</b>	1/4 cent/bu (\$12.50/contract)
<b>Contract Months</b>	Dec, Mar, May, Jul, Sep
<b>Trading Hours</b>	Open Auction: 9:30 a.m. – 1:15 p.m. Chicago Time (Mon–Fri) Electronic Platform: 8:30 p.m. – 6:00 a.m. Chicago Time (Sun–Fri)**
<b>Ticker Symbols</b>	Open Auction: C Electronic Platform: ZC
<b>Daily Price Limit</b>	20 cents/bu (\$1,000/contract) above or below the previous day's settlement price

## CBOT Corn Options Contract Specifications

<b>Trading Unit</b>	One CBOT Corn futures contract (of a specified month)
<b>Tick Size</b>	1/8 cent/bu (\$6.25/contract)
<b>Strike Price Intervals</b>	5 cents/bu for the first two months and 10 cents/bu for all other months
<b>Contract Months</b>	Dec, Mar, May, Jul, Sep; a monthly (serial) option contract is also listed when the front month is not a standard option contract.
<b>Trading Hours</b>	Open Auction: 9:30 a.m. – 1:15 p.m. Chicago Time (Mon–Fri) Electronic Platform: 8:30 p.m. – 6:00 a.m. Chicago Time (Sun–Fri)**
<b>Ticker Symbols</b>	Open Auction: CY for calls/PY for puts Electronic Platform: OZC
<b>Daily Price Limit</b>	20 cents/bu (\$1,000/contract) above or below the previous day's settlement price

\*The Chicago Board of Trade also offers a 1,000 bushel CBOT mini-sized Corn, Wheat, and Soybean futures contract.

\*\*Effective January 1, 2004, the electronic market hours will be expanded to 7:30 p.m. - 6:00 a.m. (Chicago Time).

