



Risk Management Tools for Dairy Farmers: Dairy Futures Contracts

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Due to the high level of government involvement in dairy markets, dairy farmers historically have had little reason to focus on price risk management. Because of recent changes in government policy, however, that is no longer the case. Milk prices are now more responsive than ever to supply and demand conditions in the marketplace. Consequently, dairy farmers now face what is, for them, an unprecedented level of price risk. The viability of today's dairy farms depends upon the ability of producers to effectively manage this risk.

One risk management tool gaining increasing attention from milk producers is the Basic Formula Price (BFP) Milk futures contract traded on the Chicago Mercantile Exchange (CME). Many dairy farmers are unfamiliar with the use of futures contracts as risk management tools. Unless dairy farmers have a basic understanding of the futures market, futures trading, and hedging, they will be unable to effectively incorporate futures market tools into their risk management strategies. The purpose of this publication is to provide that basic understanding.

Futures Market Concepts and Definitions

In simplest terms, a *futures contract* is an agreement to either buy or sell a given commodity at some specified time in the future. Futures contracts exist for various commodities, including all major grain and livestock products. In addition, futures contracts exist for metals, lumber, currencies, and other financial instruments. Futures contracts are completely standardized, so that the only thing negotiated is the price. The amount of the commodity to be traded, the quality of that commodity, the date, and (for some commodities) even acceptable delivery points are the same in every futures contract. All that is determined by the contract's buyer and seller is the price at which the transaction will occur.

A *futures market* is nothing more than a marketplace in which futures contracts are traded. The two major futures markets, the Chicago Board of Trade and the CME, are both located in Chicago. The Chicago Board of Trade deals primarily in grain futures, and the CME deals in futures on perishable commodities and in financial futures.

Futures markets are used by three major types of traders: *commodity users*, *commodity suppliers*, and *speculators*. Commodity users and suppliers trade in the futures market to manage price risk on the commodities that they either use or produce. This practice is known as *hedging*. Speculators rarely use or produce the commodities on which they trade. They simply are trying to make money on changes in futures prices.

It is possible for the same person to play all three roles in the market. For example, a large Midwestern feedlot might use the futures market to hedge purchases of corn, to hedge sales of fed cattle, or to speculate on price changes in these or any other commodity market.

For some people, the term *speculator* carries negative connotations; however, speculators play a very important role in futures markets by providing liquidity to the market. That is, they give hedgers somebody to trade with. Without speculators in the market, hedgers would have a hard time finding anyone to take the opposite side of their transactions, and the futures market no longer would be an effective risk management tool for them.

The difference between hedging and speculating does not depend upon the occupation of the person making the transaction, but the reason for the transaction. A futures market transaction is a hedge if that transaction eventually will be followed with the same type of transaction in the cash market. In fact, this description provides a very common definition of a hedge: a hedge is a temporary substitute for an eventual cash market transaction.

For example, if a dairy farmer sells a September BFP Milk futures contract in May, anticipating having milk to sell in the cash market in September, that transaction is a hedge. If that same farmer sells 200,000 pounds worth of September BFP Milk contracts (one full contract) in May, knowing that the farm will only produce 100,000 pounds of milk to sell in September, then the farmer is hedging with half the contract and speculating on the other half.

This example points up an interesting feature of futures market transactions. That is, you do not have to buy a contract before you sell one. In fact, rather than thinking in terms of buying and selling, it is more accurate to think of futures market transactions as legal commitments. In other words, instead of saying that a person has sold a BFP Milk futures contract, it is more accurate to say that the person has made a legal commitment to deliver milk at some future date. In the language of futures traders, this is known as taking a *short* position. Likewise, a person who has bought a BFP Milk futures contract has made a legal commitment to accept delivery of milk at some future date. This is known as taking a *long* position.

At some point, most traders will want to offset previous positions they have taken in the futures market. In other words, for every contract sold (bought), the trader eventually will want to buy (sell) the same type of contract. Offsetting transactions in this manner is called a *round-turn*. Transactions that have not yet been offset are said to be *open*.

With most commodities, traders generally offset their positions before the contract expires so they do not have to deliver or take delivery on their contracts. This is not an issue with BFP Milk futures contracts, since they are cash settled at the end of the contract period. That is, if a person is holding an open position at the time set for the contract to expire, the CME automatically offsets that open position, and the trader incurs any loss or receives any gain resulting from the transaction.

Hedging Basics

Since people seldom deliver on any futures contracts and never deliver on BFP Milk contracts, it may not be clear how they can help producers manage their price risk. Futures markets are useful risk management tools since futures prices and cash prices generally move in the same direction. Thus, gains in the futures market will offset losses in the cash market. An example will help to illustrate this point:

Suppose that in the current month (say, March) milk prices are favorable, and a dairy producer wants to take advantage of this situation by hedging the milk to be produced six months from now. To place the hedge, the dairy producer would want to sell a September BFP Milk futures contract (i.e., take a short position in the September BFP Milk futures market). The hedge can be summarized as follows:

March

Sell September BFP Milk futures contract at \$16/cwt
Current cash price = \$17.50/cwt

In September, when the producer is ready to sell milk in the cash market, the hedge can be lifted by the purchasing of a September BFP Milk contract (i.e., taking a long position in the September BFP Milk futures market):

September

Buy September BFP Milk futures contract at \$14/cwt
Sell milk on cash market at \$15.50/cwt

The actual gross receipts for the farmer consist of the cash selling price of \$15.50/cwt plus the gain in the futures market position of \$2/cwt:

Total gross receipts: \$15.50/cwt + \$2/cwt = \$17.50/cwt

This is an example of a *short hedge*. A short hedge is a hedge initiated with the sale of a futures contract. Short hedges are used by producers of a commodity. A hedge that is initiated with the purchase of a futures contract is called a *long hedge*. Long hedges are used by the purchasers of the physical commodity. The dairy farmer in this example would use a long hedge to lock in a price for corn or soybean meal used in feed. The mechanics of the hedge would be identical to the above example; however, the order of the transactions would be reversed. In other words, a corn or soybean meal contract would be bought first and sold later.

Note that the farmer received a price that was equal to the cash price at the time the hedge was placed. Changes in the cash market were offset exactly by changes in the futures market. In the example above, if the cash market had risen, cash market gains would have been offset exactly by futures market losses, and the farmer's gross receipts would have been less than could have been received using the cash market alone. The point is that a straight futures market hedge such as the one illustrated here will not necessarily lead to a better price. The primary purpose of a hedge is not to get a higher price, but to minimize the risk associated with variable prices.

Notice also that in the previous example, the cash market price was a constant \$1.50/cwt below the September futures price. This difference between cash and futures prices is called the *basis*. The basis will not always remain the same. Changes in the basis will influence the effectiveness of a hedge.

Using the preceding example, suppose that in September, the September BFP Milk futures contract was trading for \$14/cwt, but the cash market price was \$16/cwt. In that case, the farmer would have received a total price for milk of \$18/cwt (\$16/cwt from the cash market and \$2/cwt from futures market gain). In that case, the hedge would have returned more than the March cash market price. On the other hand, suppose that in September the cash market price was \$15/cwt. In this case, the farmer would have received a total price for milk of just \$17/cwt (\$15/cwt from the cash market and \$2/cwt from futures market gains).

In effect, what a futures market hedge does is allow a hedger to exchange price risk for basis risk. Generally, basis is less variable than price because, as noted earlier, cash and futures markets move together. Note, however, that the basis will be different at each local market. For example, corn growers in central Illinois do not face the same basis as corn growers in western Kentucky because they sell on different cash markets. This variation in basis also holds true for dairy producers. Even producers who sell to the same co-op will receive different mailbox prices due to different butterfat and protein levels and different transportation costs. These differences in mailbox prices translate into a different basis.

Since BFP Milk futures have been traded for a relatively short time, there is not as yet a great deal of basis information available. The CME has published basis data for the 1995-1997 period¹; however, the data is aggregated into fairly large regions. Because basis can vary with the local market and even among producers within a market, an individual farmer's basis could differ significantly from this published basis data. Producers who are serious about effectively using the futures market should keep up with basis for their own farms.

Farmers should be aware that hedging with futures contracts will require them to maintain a *margin account* with a broker. This account represents their equity in the open futures market position. If futures prices move against their open position (i.e., the open position is losing money), money is taken from the margin account to cover the losses. The farmer then will be required to deposit more money into the account in order to maintain a constant level of equity. The notification received when a deposit to the margin account is required is known as a *margin call*. Additionally, each futures market transaction will involve a brokerage fee. The amount of this fee will vary from broker to broker.

Summary

Hedging with futures contracts provide one means for producers to deal with the risk associated with variable commodity prices. When hedging, a producer takes a position in the futures market that is the opposite of the position held in the cash market. Hedging with futures contracts reduces price risk because in general, losses in one market will be offset by gains in the other market. This offset occurs because cash and futures market prices tend to move together. The difference between prices in the two markets is known as basis. While basis can change, it tends to be less variable than prices, so hedging—which trades price risk for basis risk—serves to reduce the overall risk faced by farmers.

¹Chicago Mercantile Exchange. *Self-Study Guide to Forward Pricing with BFP Milk Put Options*. CME. Chicago: 1998.