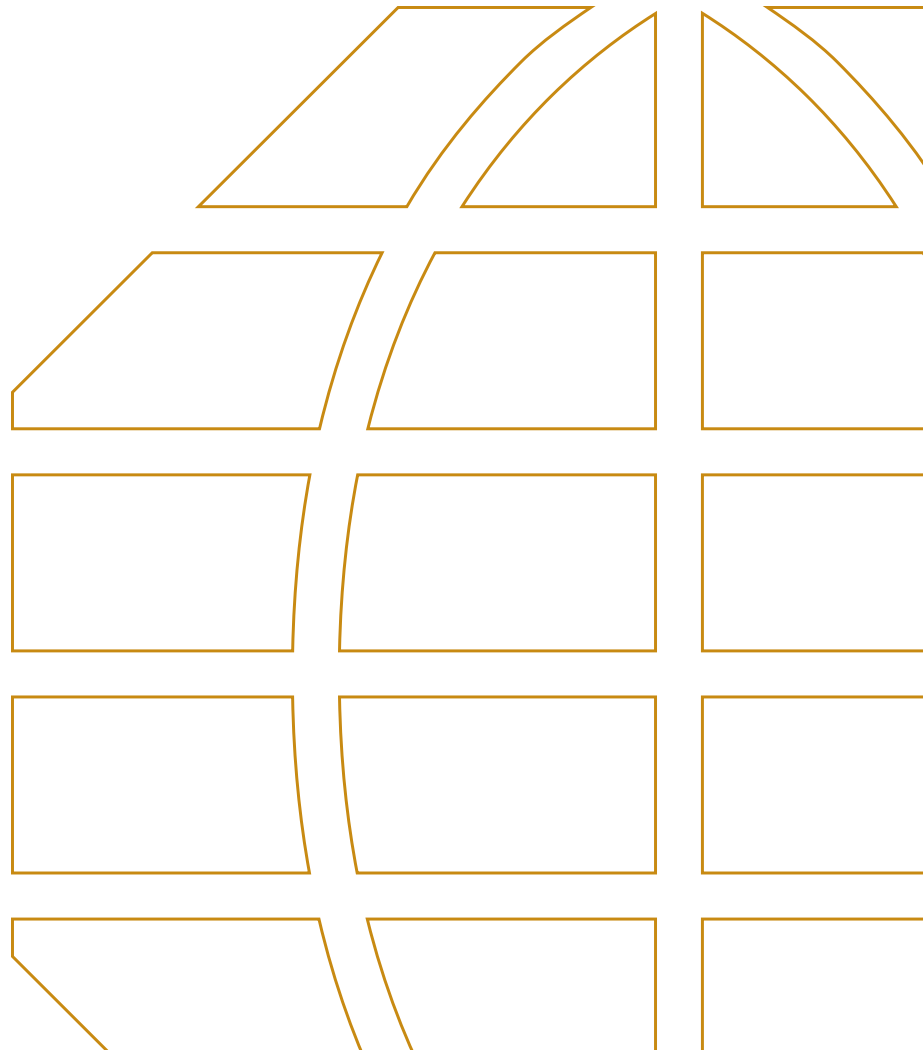


RESEARCH AND PRODUCT DEVELOPMENT

An Introduction to Cattle Feeding Spreads

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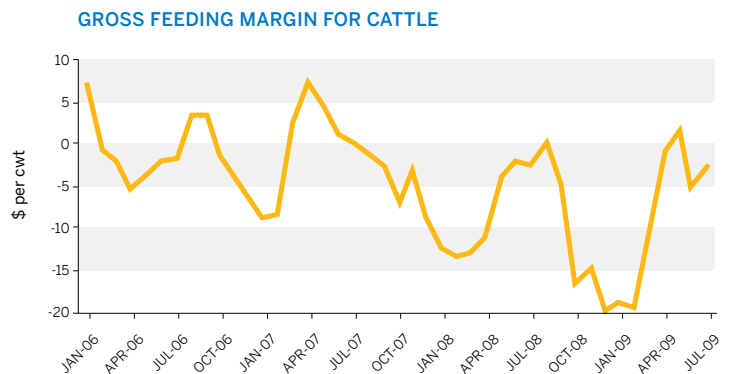


This article will discuss the concept and operation of the beef cattle feeding process in the context of what is commonly known as the cattle feeding spread or “cattle crush”.

Through the use of various combinations of CME Group derivative products, market participants have the ability to simulate the financial aspects of several real world product transformations for the opportunity to hedge price risks or profit from pricing opportunities. The “crush” expression is taken from the soybean processing term for buying soybeans, crushing them and selling the resulting soymeal and soyoil. In the soybean crush transformation, a raw material is broken down into underlying components. The cattle feeding process differs in that it turns inputs into one finished product. Specifically, feedlot operators buy feeder calves and feed to start the process. Then, after a period of time, they sell finished cattle ready for slaughter. A cattle feeding spread models the economics of the operation and provides a way to estimate profitability.

A feedlot will typically purchase 650-850 pound calves and sufficient feed to grow the animals into 1200-1400 pound cattle. This process takes place over four to six months and each animal consumes almost two tons of feed. Using a combination of feeder cattle, corn and live cattle futures contracts, a trader can put on positions that will simulate the feeding process in many respects. Although soybean meal is also consumed, it is only a very small part of the feeding ration so it will not be included in this discussion. It should be understood that the time period for feeding and the rate of gain can vary due to factors such as market forces or weather conditions. Further, some expenses such as operating overhead, death losses, transportation, other ingredients added to the rations, medications and veterinarian bills are not addressed in the examples. The relationship of the local cash markets for cattle and feed to the futures markets (the basis) is also needed to calculate what the end result will be for a particular location.

The difference between the purchased inputs value and the sold finished cattle value is known as the gross feeding margin (GFM). The graph below depicts the monthly GFM for an Iowa-based feedlot since 2006 using cash market prices. As can be seen, there is a high degree of movement in the feeding margin which motivates feedlot operators to seek ways to hedge the financial aspects of their operations. The futures cattle crush trade can provide a vehicle for price risk management.



Source: Iowa State U.

A cattle crush trade that represents the feeding process consists of a purchase of feeder cattle and corn futures combined with a sale of live cattle futures. Different numbers of each contract are necessary to balance the crush properly. Because a feeder cattle contract covers about 65 animals and a live cattle contract only covers about 32 animals, the number of live cattle contracts sold must be double the number of feeder cattle contracts bought. In general, eight pounds of feed will produce one pound of beef. One contract of corn (5,000 bushels or 280,000 pounds) is sufficient to feed one contract of feeder cattle (50,000 pounds) to a finishing weight equivalent to two live cattle contracts (80,000 pounds). Other ratios that more exactly follow feeding conversion rates are also used but require higher quantities of futures, such as three corn- four feeders/eight live cattle or four corn- five feeders/10 live cattle.

The feeder cattle contract that is purchased should be four to six months earlier than the live cattle contract that is sold; this represents the amount of time required to feed an animal to slaughter weight. The contract month for corn can fall between the feeder cattle and live cattle contract months. In this way, the feeder cattle contract will expire first. Since feeder cattle futures contracts are cash settled, there is no delivery for them. If the entire spread combination is offset by the time the chosen feeder cattle futures expire, delivery of corn or live cattle futures will not be a concern. However, feedlot operators might keep the corn and live cattle positions open to provide hedges against any ongoing feed purchases and the final sales of the finished cattle. Some possible feeder cattle-corn/live cattle spread trade combinations are:

Feeder Cattle	Corn	Live Cattle	Feeder Cattle	Corn	Live Cattle
January	March	June	August	December	December
March	May	August	September	December	February
April	July	October	October	December	February
May	September	October	November	March	April

To assess the value of the spread, traders total the values of the corn and feeder cattle inputs and subtract that figure from the value of the live cattle. For example, with November feeders at \$100 per hundred pounds (cwt), one contract of 50,000 pounds is worth \$50,000. A single contract (5,000 bushels) of March corn at \$3.20 per bushel is worth \$16,000. The total of these inputs is \$66,000. Two futures contracts of live cattle are 80,000 pounds and at a price for December of \$90 per cwt are worth \$72,000. At the values noted in the example, the cattle crush or GFM has a positive value of \$6,000 and can also be expressed as a positive value of \$7.50 per cwt of live cattle (\$6,000 divided by 80,000 pounds) or \$12 per cwt of feeder cattle (\$6,000 divided by 50,000 pounds).

In July, a feedlot operator plans for cattle to begin feeding in November. If the prices noted above are trading in July, the spread is profitable. To hedge the risk that prices may turn unfavorable by November, a cattle crush trade is put on. In November, the operator will purchase cattle in the cash market. As that process unfolds, the feeder side of the hedge will be offset and, as the corn component is purchased, so will the corn hedge. If by November feeder prices have risen, the operator will realize a gain in the value of the long futures position. Similarly, if corn prices rise, a profit on the long futures position will result. The gains from the futures positions for the inputs will be used to offset the increased cost in the cash market. If the short position in live cattle futures is kept in place until April, it will protect the operator from any decline in prices for finished cattle. The combined futures positions of corn and feeder cattle with an opposite position in live cattle can receive a reduction in the level of performance bonds required compared to the levels required for the outright positions.

Of course, speculators also can benefit from these cattle crush trades. Traders who want to use these spreads to feed cattle “on paper” can put on a forward crush. Other traders may prefer to use a contrarian strategy by using a reverse cattle crush when they believe price relationships differ from historical levels. These reverse spreads involve taking opposite futures positions to those that a livestock feeder would use. For example, a reverse crush trader may sell one corn contract and one feeder contract each, coupled with buying two live cattle contracts.

Those who trade a forward cattle crush try to put on the trade for as much value as they can and attempt to buy it back for less. Using the example for November feeders noted above, the forward crush trader hopes that the crush value of \$6,000 will decrease so that the trade can be unwound at a profit. If live cattle futures prices decrease to \$85 per cwt with feeder cattle and corn prices staying unchanged, the value of the two live cattle contracts will fall to \$68,000 while the value of the inputs stays at \$66,000. The new crush value is now \$2,000 and the profit is \$4,000 (\$6,000 beginning value minus \$2,000 ending value). Alternatively, the prices for corn futures or feeder cattle futures could rise with live cattle prices unchanged and that would also decrease the crush value. Reverse crush traders attempt the opposite and seek to buy the crush value at a low level and then sell it at a higher level.

A strategy involving options could include buying call options on feeder cattle and corn to protect against higher prices for those inputs while leaving open the opportunity to gain from lower prices. The estimated maximum purchase price is the strike price of the chosen option plus the premium for the option plus the estimated local basis for the input. Buying a put option for live cattle could accomplish the same goal as selling a live cattle futures contract after accounting for the cost of the put. If live cattle prices had decreased by slaughter time, protection in the form of a price floor would be in place. It is even possible for a combination of option buying and selling to provide the same level of protection at a decreased cost in premiums but that will also entail a decrease in the opportunity to take advantage of favorable price movements.

Agricultural traders can take advantage of these opportunities available in the livestock feeding sector at reduced capital costs while continuing to manage price risk and maintaining effective trading strategies.

For more information about the costs of trading or the design of trading strategies, contact your broker.

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