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RESEARCH AND PRODUCT DEVELOPMENT

An Introduction to Hog Feeding Spreads

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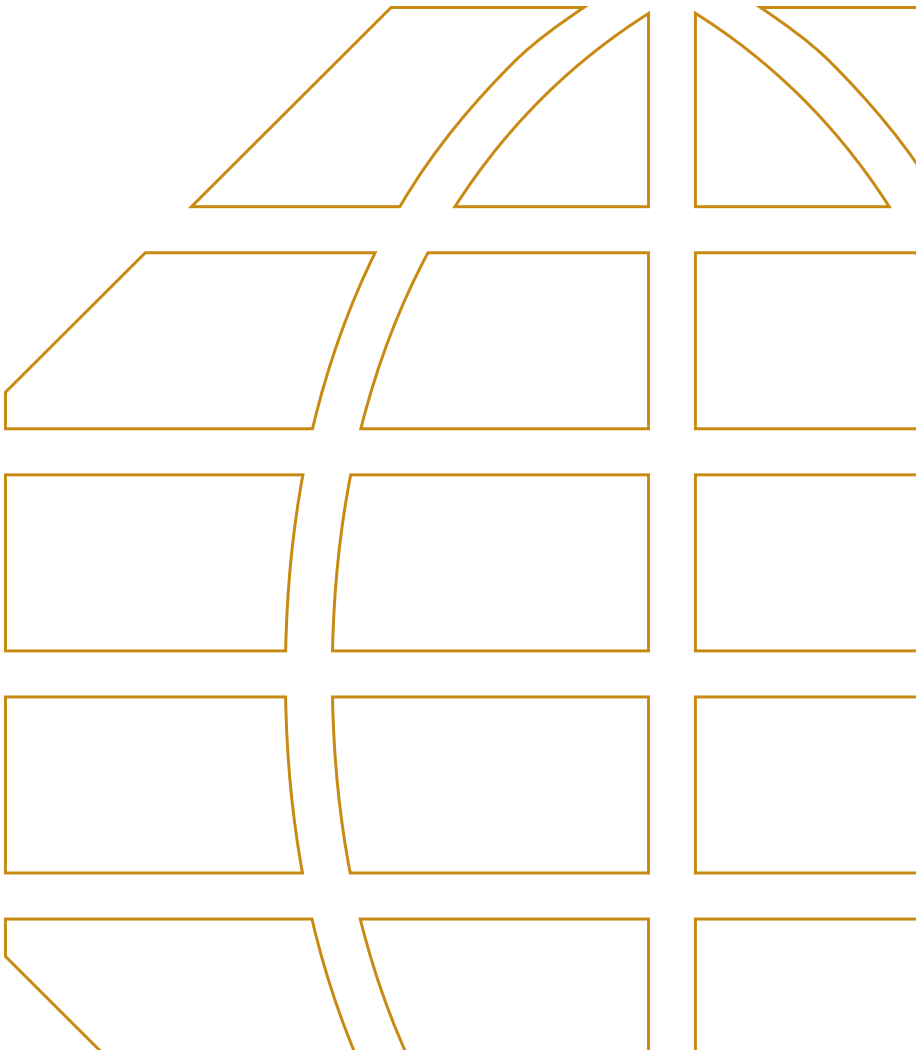


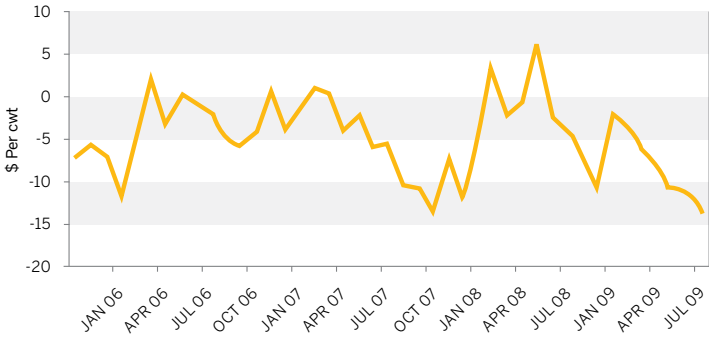
This article will discuss the concept and operation of the hog feeding process in the context of what is commonly known as the hog feeding spread or "hog crush".

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 hog feeding process differs in that it turns inputs into one finished product. Specifically, hog feeders keep newborns or buy young pigs and feed to start the process. Then, after a period of time, they sell finished hogs ready for slaughter. A hog feeding spread models the economics of the operation and provides a way to estimate profitability.

The majority of hogs are now shipped as young pigs (10-50 pounds) to finishing facilities that grow the animals to 240-270 pounds for slaughter. This process takes place over four to five months and each animal consumes almost 1,000 pounds of feed. Using a combination of futures contracts on soybean meal, corn and lean hogs, a trader can put on positions that will simulate the feeding process in many respects. 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, additional ingredients added to the rations, medications and veterinarian bills are not addressed in the examples. The relationship of the local cash markets for hogs 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 hog value is known as the gross feeding margin (GFM). The graph below depicts the monthly GFM for an Iowa-based hog finisher since 2006 using cash market prices. As can be seen, there is a high degree of movement in the feeding margin, which motivates hog finishers to seek ways to hedge the financial aspects of their operations. The futures hog crush trade can provide a vehicle for price risk management.

GROSS FEEDING MARGIN FOR HOGS



Source: Iowa State U.

A hog crush trade that represents the feeding process consists of a purchase of soymeal and corn futures combined with a sale of lean hog futures. A common ratio for the feed mix is one part soymeal to four parts corn and four pounds of feed will be converted into about one pound of pork. For example, one contract of soymeal (100 tons or 200,000 pounds) coupled with three contracts of corn (15,000 bushels or 840,000 pounds) will produce the equivalent of seven lean hog futures contracts (280,000 pounds).

The soymeal and corn contracts that are purchased should be four to five months earlier than the lean hog contracts that are sold; this represents the amount of time required to feed an animal to slaughter weight. To avoid delivery of the feed, the corn and soymeal contracts should be offset prior to the delivery period. However, feedlot operators might keep the lean hog positions open to provide hedges against the final sales of the finished animal. Some possible soymeal-corn/lean hog spread trade combinations are:

Soymeal	Corn	Lean Hogs	Soymeal	Corn	Lean Hogs
March	March	May	September	September	October
March	March	June	September	September	December
May	May	July	December	December	February
July	July	Aug	December	December	April

To assess the value of the spread, traders subtract the combined values of the corn and soymeal inputs from the value of the lean hogs. For example, with December corn at $3.20 per bushel, three contracts are worth $48,000. A single contract of December soymeal at $275 per ton is worth $27,500. The total of these inputs is $75,500. Seven futures contracts of lean hogs are 280,000 pounds and at a price for April of $60 per hundred pounds (cwt) are worth $168,000. At the values noted in the example, the hog crush or GFM has a positive value of $92,500 and can also be expressed as a positive value of $.33 per cwt of lean hogs ($92,500 divided by 280,000 pounds).

In July, a hog finisher plans for hogs to begin feeding in December. If the prices noted above are trading in July, the spread is profitable. To hedge the risk that prices may turn unfavorable by December, a hog crush trade is put on. In December, the operator will purchase young pigs in the cash market. As that process unfolds, the feed side of the hedge will be offset. If by December feed prices have risen, the operator will realize a gain in the value of the long futures positions. 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 lean hog futures is kept in place until April, it will protect the operator from any decline in prices for finished hogs. The combined futures positions of corn and soymeal with an opposite position in lean hogs 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 hog crush trades. Traders who want to use these spreads to feed hogs “on paper” can put on a forward crush. Other traders may prefer to use a contrarian strategy by using a reverse hog 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 soymeal contract and three corn contracts each, coupled with buying seven lean hog contracts.

Those who trade a forward hog 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 April hogs noted above, the forward crush trader hopes that the crush value of $92,500 will decrease so that the trade can be unwound at a profit. If lean hog futures prices decrease to $55 per cwt with soymeal and corn prices staying unchanged, the value of the seven lean hog contracts will fall to $154,000 while the value of the inputs stays at $92,500. The new crush value is now $78,500 and the profit is $14,000 ($92,500 beginning value minus $78,500 ending value). Alternatively, the prices for corn futures or soymeal futures could rise with lean hog 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 soymeal 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 lean hogs could accomplish the same goal as selling a lean hog futures contract after accounting for the cost of the put. If lean hog 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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