

This Issue

Feature Article

Pages 2-4

Why You Should Get to Know Delta 2

Margin Watch Reports

Pages 5-11

Hog 5

Dairy 6

Beef 7

Corn 9

Soybeans 10

Wheat 11

Dear Ag industry associate:

A change in leadership of any organization will generally usher in uncertainty in varying degrees and the new administration in Washington is no exception. President Trump's first two weeks have brought uncertainty to many industries, including agriculture. While trade across the whole of the sector has been quite robust of late, we can't be certain whether that trend will continue, as some of the President's proposals could pose impediments to the continued unencumbered movement of agricultural products and by-products.

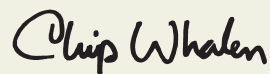
Uncertainty over future trade was just one factor that pushed margins lower across the beef, dairy and wheat sectors over the past two weeks. At the same time, hog margins were mixed, and corn and soybeans settled near unchanged after some periods of volatility.

What we do know for sure is that uncertainty breeds volatility. With that uncertainty in mind, this month's feature article focuses on using options to gain flexibility to both establish price protection and preserve opportunity. We explore the notion of the delta of options, illustrating the importance of knowing with certainty how a given option will react to market volatility.

In addition, the regular Margin Watch reports summarize news and margin trends in each industry as we move carefully into the uncertain new year.

As always, if you have questions, please feel free to contact me.

Respectfully,



Chip Whalen is the managing editor of MarginManager and the vice president of education and research for CIH. He teaches classes on margin management throughout the country and can be reached at cwhalen@cihedging.com.

Upcoming Education Events

**Beef Margin Management
Omaha**

February 22-23

**Hog Margin Management
Chicago**

March 1-2

Why You Should Get to Know Delta

Today, many agriculture operations find they need the flexibility of exchange-traded options, which allow you not only to protect attractive margins, but also capture future incremental improvements. If you've avoided options due to their complexity or cost (or both), an understanding of delta can help you overcome these hurdles so you can gain the pricing flexibility you need.

Delta Reflects Protection

Put simply, delta is the sensitivity of an option's value to a futures price change. If an option position is held until expiration, it either essentially becomes a futures contract or it expires worthless. But until then, option positions have value – expressed as a premium – that vary over time and in response to changes in the underlying commodity futures contract. For each option position, or combination of option positions, we can measure the extent to which its value will change when the futures price of the underlying commodity changes. That is the position's delta.



Just as the premium of an option is an objective reflection of its value, delta is an indicator of the amount of protection afforded by each option position. Together, premium and delta allow you to calibrate the precise cost/protection balance of an option position.

Calibrate Your Delta to Match your Needs

Delta is measured as a percentage from 0 to 100, and can be positive or negative, depending on the direction of the change in value. If a futures contract rises by \$1, a call option on that contract with a delta of 25 percent would rise in value by about \$0.25, while a put option on that same futures contract with a delta of -50 percent would decrease in value by about \$0.50. The higher the absolute delta, the stronger the hedge and the higher the degree of protection the position will provide to an adverse change in price.

For example, let's say Class III milk futures are trading at \$17 per hundredweight (cwt) and corn is at \$4 per bushel. If you want to protect that milk price, and leave open the possibility of participating in further price gains, you could purchase a put option with a strike price of \$17. A put option gives you the right, but not the obligation to sell milk at the strike price. Because the strike price of the put is the current market price, this option will have a delta of -50 percent. If milk futures then rise to \$19, or by \$2, the value of your option might lose most, if not all, of its value, but you will be able to sell your milk on the cash market for \$19. What happens if milk futures decline instead by the same \$2? The value of your put option will rise by \$1, and you have the right to sell milk at \$17.

If the cost of that protection seems too high, you could consider adding a second piece to your hedging strategy. In addition to buying the put option (establishing a \$17 price floor), you could sell a call option at a strike price of \$19. This position establishes an obligation to sell, but at a price that is above the current market. The combined position has a lower total cost since the premium you collected from selling the call would offset some of the cost of the put. It also has a higher delta (closer to -75%) than the put option alone, and thus will provide more protection against declining milk prices. The tradeoff, however, from that higher delta is less opportunity to participate in higher prices.

Manage Both Sides of the Margin Equation

A savvy livestock or dairy producer will manage margins by addressing not only revenues, but also feed costs. With grain prices hovering near historical lows, it might make sense to simply book feed ingredients in the cash market with a local supplier. On the output side, however, there's more room for both gains and losses. Even if your current projected margin compares favorably with historical levels, you may want to preserve the opportunity to participate in higher prices if the market continues moving up. And it's always a good idea to protect your operation against the risk of significant declines.

You can accomplish this dual goal by purchasing a put option against output prices, as described in the milk example. Those positions are illustrated in the below table.

	INITIAL RISK	CASH MARKET POSITION	EXCHANGE MARKET POSITION	DELTA	NET EXPOSURE
Feed	Short	Buy forward	-	100%	0%
Output	Long	-	Buy put	-50%	50%

Since the strategies for feed and output are different, they carry different net exposures and deltas. The grain is already priced in the cash market and there are no corresponding exchange positions, thus the delta (protection) of the feed position is effectively 100% and the net exposure is 0%. We know the delta on the output position is neutral, -50%, providing a balance between protection against price declines and an equal opportunity to participate in gains. The net exposure of 50% is consistent with an expectation for increased prices for output, such as milk, hogs or cattle.

Protection in Stronger Margin Environments

But we can also imagine a very different margin environment, where prices are relatively high and margins are very strong. For example, let's say milk is trading at \$19 per cwt and feed ingredients are already secured in the cash market. In this case, you might have a more

negative bias, expecting prices to decline over time. For that reason, it would make sense to have a stronger delta on the milk, or output, side of the equation.

You could protect the historically attractive milk price by selling a futures contract. The delta on that position would be -100 percent. If however, you still believe there is some opportunity for milk prices to rise and you would like to participate in further price increases, you may choose a strategy with a strong delta. Let's assume you buy a \$19 put option and simultaneously sell a \$21 call option. This strategy will likely have a delta of around -75%, meaning that you are protecting 75% of risk from lower prices while allowing for 25% opportunity to participate in higher prices. In this case, your overall hedge profile would look like the below table.

	INITIAL RISK	CASH MARKET POSITION	EXCHANGE MARKET POSITION	DELTA	NET EXPOSURE
Feed	Short	Buy forward	-	100%	0%
Output	Long	-	Buy put Sell call	-75%	25%

These examples are simplified in that they show a static delta. In fact, both delta and premiums will fluctuate over time as the futures market changes. This is true for both a single option position as well as a multi-option position. As prices change, margins will also vary. You may find that over time, as prices and margins fluctuate, you wish to maintain a different degree of protection, and thus a different delta. That's why you may wish to adjust a hedge position – and your delta – to maintain the cost/protection balance that's right for your operation.

If you have questions or would like more information, please call CIH at 1.866.299.9333.

Hog Margin Watch: January



Hog margins were mixed over the last half of January, weakening in spot Q1 and Q2 while strengthening in Q3 and Q4. Soybean meal prices eased slightly over the past two weeks after significant recent gains, while corn was flat and hogs were steady to higher. Margins remain below average relative to history although still positive in Q2 and Q3. Hog prices have been supported by strong demand indications despite increased supply. USDA's latest Cold Storage report showed the highest December decline in pork inventories since 1985 and the lowest month-end figure since 2010. Total pork in cold storage was reported at 477 million pounds, down 8.0% from November and 12.5% from 2015. Pork bellies led the decline, as stocks at 17.8 million pounds were the lowest on record for a year-end going back to 1973. Meanwhile, federally inspected hog slaughter in December was a record high of 10.4 million head, with strong weekly kill rates continuing in January. Through last week, hog slaughter since December 1 has been 3% larger than last year, as weekly pork production totals broke records. Feed prices have eased somewhat following recent rainfall in parched growing regions of Argentina and welcome dryness in others. While concerns over reduced acreage and yields remain, the change in weather has moderated some of the bullish enthusiasm over soybean meal in particular. In addition, recent executive orders from the new Trump administration on immigration, as well as its commitment to build a border wall with Mexico – and possibly tax imports from the country as much as 20% to pay for it – have reignited fears of a trade war. Our hog producer clients have been focused recently on adding flexibility to existing soybean meal positions and strengthening hog protection.

1st Qtr '17 2016 2017 Q1 2017: HIGH (\$0.57) LOW (\$17.00) LAST (\$0.57) 10YR PERCENTILE 45.8%



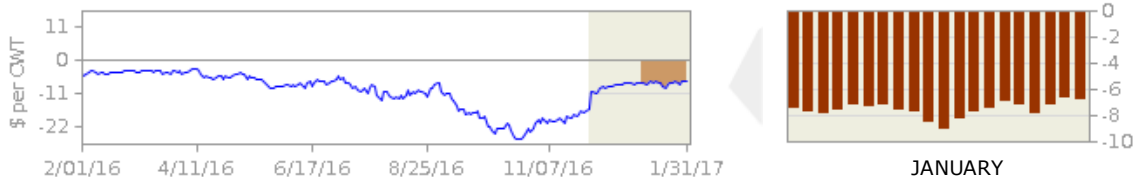
2nd Qtr '17 2016 2017 Q2 2017: HIGH \$7.07 LOW (\$3.45) LAST \$5.63 10YR PERCENTILE 38.5%



3rd Qtr '17 2016 2017 Q3 2017: HIGH \$2.21 LOW (\$6.86) LAST \$1.44 10YR PERCENTILE 31.4%



4th Qtr '17 2016 2017 Q4 2017: HIGH (\$6.60) LOW (\$10.78) LAST (\$6.69) 10YR PERCENTILE 27.7%



The Hog Margin calculation assumes that 73 lbs of soybean meal and 4.87 bushels of corn are required to produce 100 lean hog lbs. Additional assumed costs include \$40 per cwt for other feed and non-feed expenses.

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Dairy Margin Watch: January



Dairy margins were flat to weaker over the second half of January, primarily due to steady to lower milk prices. From a historical perspective, margins remain at above the 90th percentile of the previous decade through the first half of 2017 and well above the 80th percentile through the second half of the year. Soybean meal prices eased slightly due to recent rainfall in dry areas of Argentina, and welcome dryness in others, quelling some of the bullish enthusiasm that precipitated a large increase in price. Corn has held steady without much feature in the market. However, recent executive orders from the new Trump administration to renegotiate NAFTA and build a border wall with Mexico have renewed trade concerns. Mexico is the largest importer of U.S. corn, and many tariffs on dairy products were reduced or removed completely under NAFTA. The USDA reported monthly milk production for December at 17.859 billion pounds, up 4.32% from November and 2.21% higher than 2015. The average year-over-year build-up for the month of December is 1.65%, so the figure was seen as slightly bearish. Meanwhile, USDA's Cold Storage report showed a build-up in dairy stocks from last month and last year. December butter stocks were 174.933 million pounds, up 8.52% from November and 12.8% higher than 2015, while cheese stocks at 23.958 million pounds were 2.03% higher than November and up 5.28% from the previous year. Given the strong forward margins, our dairy producer clients have been initiating new protection in deferred periods with flexible strategies that will allow for further margin improvement over time. In addition, clients have also benefited from recent adjustments to existing positions to strengthen milk coverage following the increase in price.



The Dairy Margin calculation assumes, using a feed price correlation model, that for a typical dairy 62.4 lbs of corn (or equivalent) and 7.34 lbs of meal (or equivalent) are required to produce 100 lbs of milk (includes dry cows, excludes heifers not yet fresh). Additional assumed costs include \$0.90/cwt for other, non-correlating feeds, \$2.65/cwt for corn and meal basis, and \$8.00/cwt for non-feed expenses. Milk basis is \$0.75/cwt and non-milk revenue is \$1.00/cwt.

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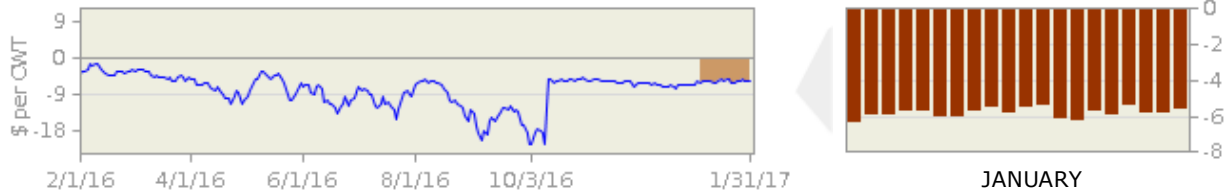
Beef Margin Watch: January



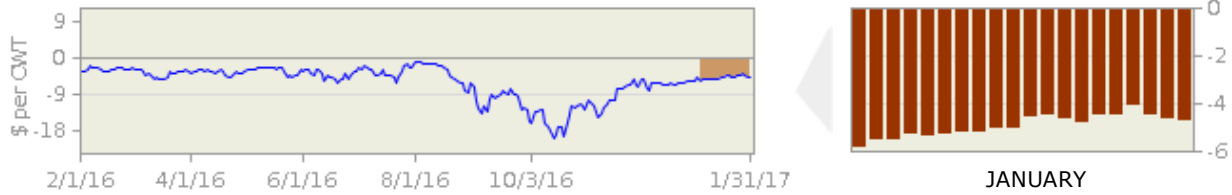
Beef margins deteriorated sharply over the second half of January following a steep decline in cattle prices, while feed costs held steady. Although margins remain positive and historically strong into the spring marketing period, concerns are growing about deferred periods given recent indications that cattle supplies will be larger than previously expected. At the end of January, USDA released both the monthly Cattle on Feed report for December along with the semi-annual U.S. Cattle Inventory report, which provides a broader picture of cattle supplies beyond feedlots of over 1,000 head. Total cattle on feed as of January 1 was reported at 10.605 million head. This was up 0.3% from last year and above market expectations of a 1% decline. The biggest surprise came in the bearish figure of December placements that, at 1.795 million head, were 17.6% more than last year and well over expectations of an 8.4% increase. Much of that cattle consist of lighter-weight animals that will not come to market until later in the summer, keeping nearby supplies relatively tight. Meanwhile, the cattle inventory report showed all cattle and calves as of January 1 up 1.8% from the previous year, with the calf crop up 2.7% from 2016. Both of those figures were higher than expected, indicating continued expansion in the beef cow herd. USDA also reported year-end beef in Cold Storage at 567 million pounds, up 6.79% or 36.049 million from November and 10.63% or 54.478 million pounds above last year. The December increase in Cold Storage compares to the average build of 2.21% and was the second-largest increase for that month since 2006. Our beef producer clients have benefited from recent adjustments to existing positions, particularly strengthening cattle hedges prior to these bearish USDA reports.

Live Cattle Marketing Periods:





Dec '17 2016 2017 Dec 2017: HIGH (**\$1.19**) LOW (**\$20.08**) LAST (**\$4.67**) 10YR PERCENTILE **28.8%**



The Beef Margin calculation uses Feeder Cattle futures to price inbound animals and assumes each will consume 55 bushels of corn and cost approximately \$250 per head (for other feed and non-feed expenses) to gain 550 pounds and reach a market weight of 1,250 pounds.

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Commodity & Ingredient Hedging, LLC
 120 South LaSalle St, Suite 2200 ▪ Chicago, IL 60603 ▪ 1.866.299.9333

Corn Margin Watch: January



Corn prices and margins are nearly unchanged from two weeks ago, but were not without movement. Strong demand from exports and record ethanol production, as well as South American weather issues, pushed the corn market higher. But talk of trade uncertainties quickly extinguished that momentum. The new Trump administration has been tweeting tough on trade and borders, leading to a cancelled meeting between President Trump and President Peña Nieto of Mexico, who is no stranger to the twittersphere himself. Mexico is the U.S.'s largest buyer of corn, taking in an average of approximately a quarter of the total shipped abroad over the past five years. The political rhetoric of NAFTA renegotiations, tariffs to pay for a wall along the border, along with the scrapped meeting, gave the market the jitters. In spite of all the talk, corn exports sales continue to do well, already at almost 70% sold of the robust USDA expectation; and weekly ethanol production continues to set new records with each fresh data point. The latest weekly average daily ethanol production figure, for the week ending January 27, was 1.061 million barrels per day, exceeding the last record by 7,000 barrels per day. Ethanol stocks, while not at record levels, have grown considerably since the end of last year, building to 21.870 million barrels from 18.678 million barrels on December 30. Given all the political uncertainty regarding trade and tariffs, many producers are considering maintaining some degree of flexibility until greater trade visibility appears or the political climate eases.



The estimated yield for the 2017 crop is 182 bushels per acre and the non-land operating cost is \$595 per acre. Land cost for 2017 is estimated at \$238 per acre ¹. Basis for the 2017 crop is estimated at \$-0.15 per bushel.



The estimated yield for the 2018 crop is 184 bushels per acre and the estimated operating cost is \$547 per acre. Land cost for 2018 is estimated at \$228 per acre ¹. Basis for the 2018 crop is estimated at \$-0.2 per bushel.

¹ The Corn Margin Watch yield, land and non-land operating cost values are based upon central Illinois low productivity farmland crop estimates in the "Historic Corn, Soybean, Wheat, and Double-crop Soybeans" report published by the Department of Agricultural and Consumer Economics at the University of Illinois.

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Soybeans Margin Watch: January



Soybean prices and margins finished the month near mid-month levels, but only after reaching recent highs. The vanishing South American weather premiums and trade war uncertainties had the soybean market reversing course. The excessive rainfall in Argentina has subsided along with some of the dire predictions of production loss. The Buenos Aires Grain Exchange now estimates production at 53.5 million metric tons, 3.5 million less than the current USDA projection, but well above some other worst-case estimates. The Brazilian crop has had fewer weather concerns and its harvest is in the beginning stages. Perhaps of even greater importance are the current political anti-trade winds blowing, particularly from the new Trump administration. President Trump is lobbying for a renegotiation of NAFTA, a tariff to finance a wall and new tougher trade terms with China, the U.S.'s main outlet for soybean exports. While all of these issues are still just trial balloons that ultimately could take many months, if not years, to play out, the soybean market is obliged to take heed. However, in spite of all the worries, U.S. soybean exports continue to excel as both sales and shipments continue to outpace the average needed to meet the USDA estimate. Given the current political trade climate, as well as some doubt as to the ultimate size of the South American soybean crop, many producers are focusing on flexibility in their hedging positions.



The estimated yield for the 2017 crop is 52 bushels per acre and the non-land operating cost is \$365 per acre. Land cost for 2017 is estimated at \$238 per acre¹. Basis for the 2017 crop is estimated at \$-0.25 per bushel.



The estimated yield for the 2018 crop is 53 bushels per acre and the estimated operating cost is \$290 per acre. Land cost for 2018 is estimated at \$228 per acre¹. Basis for the 2018 crop is estimated at \$-0.3 per bushel.

¹ The Soybeans Margin Watch yield, land and non-land operating cost values are based upon central Illinois low productivity farmland crop estimates in the "Historic Corn, Soybean, Wheat, and Double-crop Soybeans" report published by the Department of Agricultural and Consumer Economics at the University of Illinois.

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Wheat Margin Watch: January



Wheat prices and margins moved lower over the past two weeks, finishing at depressed levels. Wheat sold off when the drumbeat of potential trade wars began just as needed moisture hit the U.S. winter wheat areas. The new Trump administration did not waste any time fulfilling campaign promises of changing the way America trades. Renegotiating NAFTA, potential tariffs to finance border fences and an official withdrawal from the TPP were among the first salvos. Further rattling the markets was the cancellation of a meeting between President Trump and Mexican President Peña Nieto. Mexico, the second largest importer of U.S. wheat, takes in approximately 7% of total U.S. wheat exports, 11% of total U.S. soybeans exports and 25% of total U.S. corn exports. A trade war between the two would certainly not be in the best interests of either country's agricultural communities. In spite of the rhetoric, the latest weekly wheat export sales figure was the highest recorded this marketing year, at 31 million bushels. Total sales of wheat now stand at almost 85% of the USDA expectation, which is 3% above the average pace of the past ten years. Given the multitudes of uncertainty on the horizon, many wheat producers are considering layering in some flexibility to hedges.



The estimated yield for the 2017 crop is 67 bushels per acre and the non-land operating cost is \$358 per acre. Land cost for 2017 is estimated at \$158 per acre ¹. Basis for the 2017 crop is estimated at \$-0.6 per bushel.



The estimated yield for the 2018 crop is 68 bushels per acre and the estimated operating cost is \$358 per acre. Land cost for 2018 is estimated at \$150 per acre ¹. Basis for the 2018 crop is estimated at \$-0.3 per bushel.

¹ The Wheat Margin Watch yield, land and non-land operating cost values are based upon central Illinois low productivity farmland crop estimates in the "Historic Corn, Soybean, Wheat, and Double-crop Soybeans" report published by the Department of Agricultural and Consumer Economics at the University of Illinois.

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