

Live Cattle Futures - The Life of a Contract Comparing Expiration to Weekly Futures Prices

The Live Cattle futures market is a single location where anyone with an opinion on what prices will be in the future can essentially vote their forecast. The resulting futures prices represent a “composite” forecast at a particular point in time. However, futures markets trade on known information and react as new information becomes available. Research has repeatedly shown that the futures are as accurate, or better, than other forecasting methods, but just how good of a predictor of the contract expiration price are weekly futures prices?

This simple analysis compares the Live Cattle weekly futures prices to their contract’s expiration price in order to evaluate their accuracy. Weekly prices were an average of the futures closing prices, Monday through Friday, for each week of the contract, from February 1997-December 2016. These weekly averages were then compared to the futures closing price on each contract’s last day of trade.

The weekly prices’ forecast errors were defined as the futures price at expiration minus the futures price in trade week 1, 2, 3, etc., and are expressed as a percentage of the expiration price. A positive error means the weekly price was below the expiration price, indicating under prediction, and a negative error means the weekly price was above the expiration price, indicating over prediction. Because more information becomes available to futures traders as the contract matures, we would expect the weekly prices to inch closer to the expiration price, decreasing their error and variability, as the contract’s end approaches.

Results

The weekly prices’ forecast errors are measured as a percent of the futures price at expiration. Figures

1-6 show the forecast errors of the February, April, June, August, October, and December contracts over their entire trading periods from 1997-2016. As can be seen, contract errors vary widely. The errors from the February, August, and October contracts are positive on average. The April, June, and December contracts’ errors vary widely and are both positive and negative throughout. As shown by these figures, each contract’s errors tend to

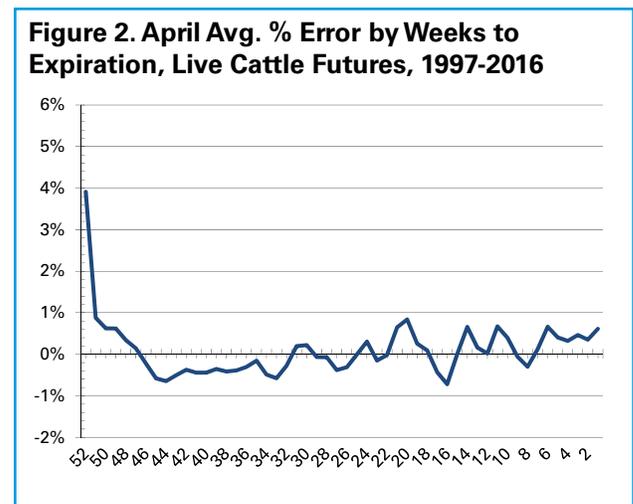
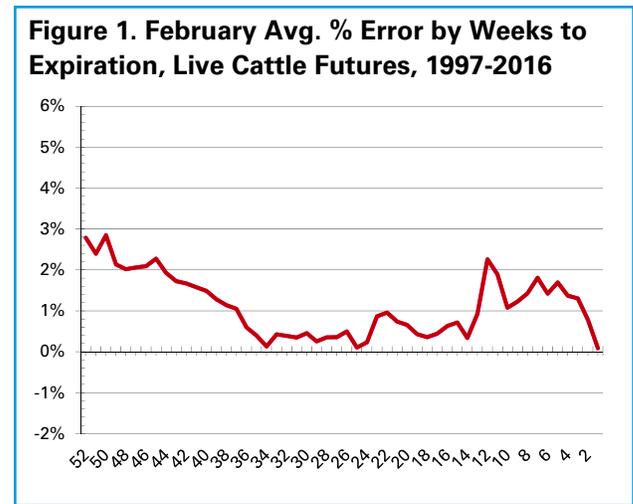


Figure 3. June Avg. % Error by Weeks to Expiration, Live Cattle Futures, 1997-2016

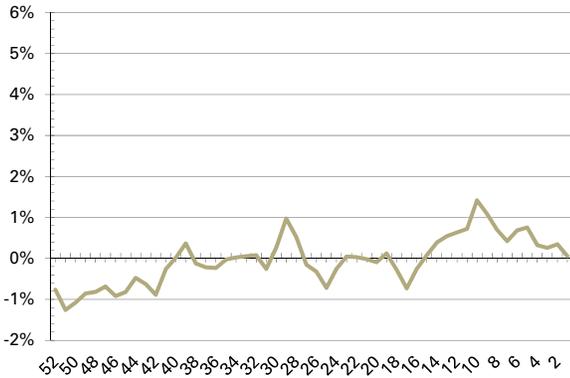


Figure 5. October Avg. % Error by Weeks to Expiration, Live Cattle Futures, 1997-2016

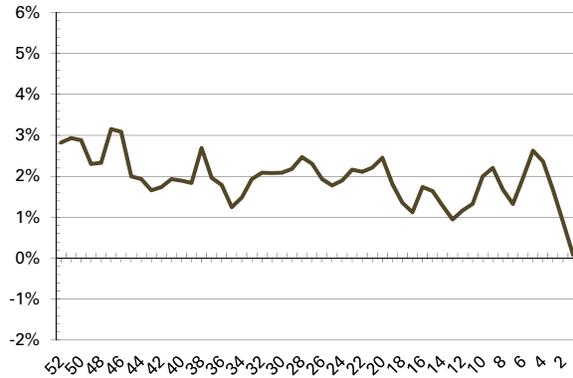


Figure 4. August Avg. % Error by Weeks to Expiration, Live Cattle Futures, 1997-2016

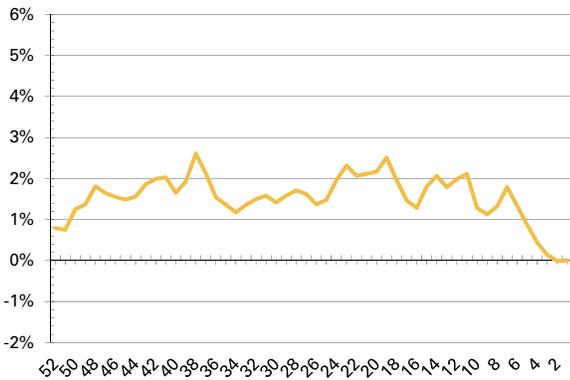
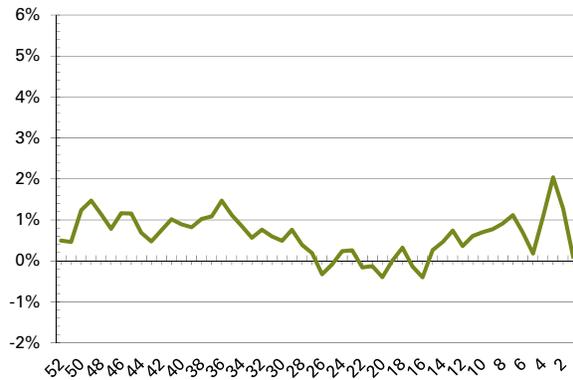


Figure 6. December Avg. % Error by Weeks to Expiration, Live Cattle Futures, 1997-2016



decrease and trend toward a zero percent error on average as the contracts mature. This is expected because as more information becomes available to traders, they are better able to make pricing decisions.

It is important to know more than the average about the forecast errors. Tables 1-6 report the average and standard deviation of the errors, and number and percentage of years each weekly price was above or below the expiration price. Standard deviation is a measure of variability around the average, and under normal conditions the actual forecast is expected to be within plus or minus one standard deviation of the average approximately two-thirds of the time. A larger standard deviation indicates more variation in the error. With all months, the variation in the errors

tends to become dramatically smaller as expiration approaches, indicating that the accuracy of the weekly prices increases closer to expiration. Years above and below again show the variation each weekly price takes from the expiration price. The February, April, August, October, and December contracts tended to have more years where the weekly prices were below the expiration price on average, indicating positive errors, or under prediction by the weekly prices. June tended to have more years where the weekly prices were above the expiration price, which indicates over prediction. However, it is important to remember that there are only 20 numbers in each of these averages at most and a large error in any one year can change the averages and standard deviations dramatically.

Table 1. Each Week's Price Compared to the Expiration Price, Live Cattle, February Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	2.8%	11.3%	6	31.6%	13	68.4%
39	1.3%	11.8%	9	45.0%	11	55.0%
26	0.5%	10.0%	6	30.0%	13	65.0%
13	0.9%	6.9%	8	40.0%	12	60.0%
1	0.1%	1.2%	11	55.0%	9	45.0%

Table 2. Each Week's Price Compared to the Expiration Price, Live Cattle, April Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	3.9%	20.3%	7	38.9%	11	61.1%
39	-0.4%	11.6%	8	40.0%	12	60.0%
26	-0.3%	8.8%	9	45.0%	11	55.0%
13	0.2%	7.7%	10	50.0%	10	50.0%
1	0.6%	1.5%	4	20.0%	16	80.0%

Table 3. Each Week's Price Compared to the Expiration Price, Live Cattle, June Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	-0.8%	13.1%	10	50.0%	10	50.0%
39	0.4%	8.7%	11	55.0%	9	45.0%
26	-0.3%	7.9%	11	55.0%	9	45.0%
13	0.5%	6.7%	12	60.0%	8	40.0%
1	0.1%	1.5%	10	50.0%	10	50.0%

Table 4. Each Week's Price Compared to the Expiration Price, Live Cattle, August Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	0.8%	13.6%	7	36.8%	12	63.2%
39	1.9%	9.4%	8	40.0%	12	60.0%
26	1.4%	8.6%	9	45.0%	11	55.0%
13	1.8%	7.1%	8	40.0%	12	60.0%
1	0.0%	1.3%	10	50.0%	10	50.0%

Table 5. Each Week's Price Compared to the Expiration Price, Live Cattle, October Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	2.8%	13.4%	7	35.0%	13	65.0%
39	1.8%	11.5%	9	45.0%	11	55.0%
26	1.9%	10.4%	7	35.0%	13	65.0%
13	0.9%	9.0%	7	35.0%	13	65.0%
1	0.1%	1.4%	9	45.0%	11	55.0%

Table 6. Each Week's Price Compared to the Expiration Price, Live Cattle, December Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	0.5%	11.5%	7	35.0%	13	65.0%
39	0.5%	10.9%	9	47.4%	10	52.6%
26	-0.3%	10.4%	7	35.0%	13	65.0%
13	0.7%	6.7%	7	35.0%	13	65.0%
1	0.1%	4.7%	7	35.0%	13	65.0%

Table 7. Overall effectiveness of contracts as predictors of expiration prices

	Average % Error	Average St. Dev.	Total Weeks Above	% Weeks Above	Total Weeks Below	% Weeks Below
February	1.1%	9.0%	415	40.0%	621	59.9%
April	0.1%	9.5%	446	43.1%	589	56.9%
June	0.0%	8.0%	551	53.4%	481	46.6%
August	1.5%	8.4%	444	42.8%	593	57.2%
October	1.9%	10.0%	410	39.4%	630	60.6%
December	0.6%	8.7%	382	36.8%	657	63.2%
Overall	1.4%	8.9%	2648	42.6%	3571	57.4%

Table 7 provides analysis on the overall effectiveness of the contracts as predictors of expiration prices. As shown by the very small average errors (1.4 percent of \$120/cwt is \$1.68/cwt), the contracts are very accurate. The most accurate months on average were April and June. However, the least variable months were June, August, and December.

This analysis is intended to provide some insight into how accurately Live Cattle futures predict the contract expiration price. The results of this simple analysis suggest that they are very accurate, and that as increasing amounts of information become available, weekly futures prices become increasingly accurate at predicting expiration prices. This is shown by the errors' tendencies to approach zero and the decreases in their standard deviations as the contract matures. As is the case in all economic situations, more information is always beneficial, and helps traders make more accurate and profitable decisions.

... and justice for all

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