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

The Feeder 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 Feeder 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 January 1997-November 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

Figures 1-8 show the forecast errors of the January, March, April, May, August, September, October, and November contracts over their entire trading periods from 1997-2016. As can be seen, contract errors vary widely. The errors from the May, August, September, and October contracts tend to be positive, indicating under prediction. The errors from the January, March, April, and November contracts' vary widely and are both positive and negative throughout. As shown by these figures, each contract's errors tend to decrease and move 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.
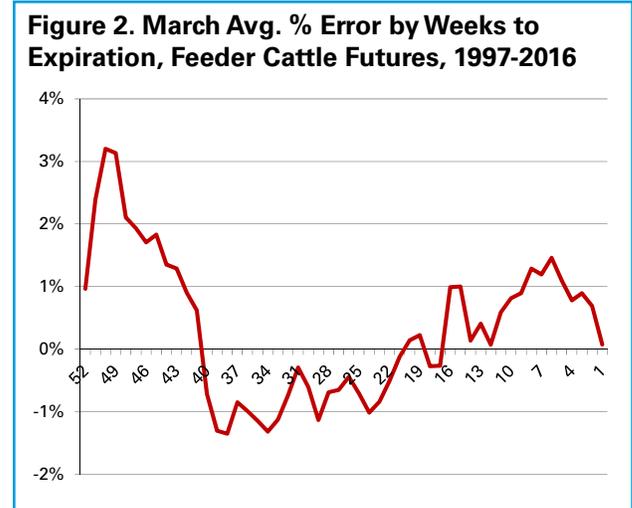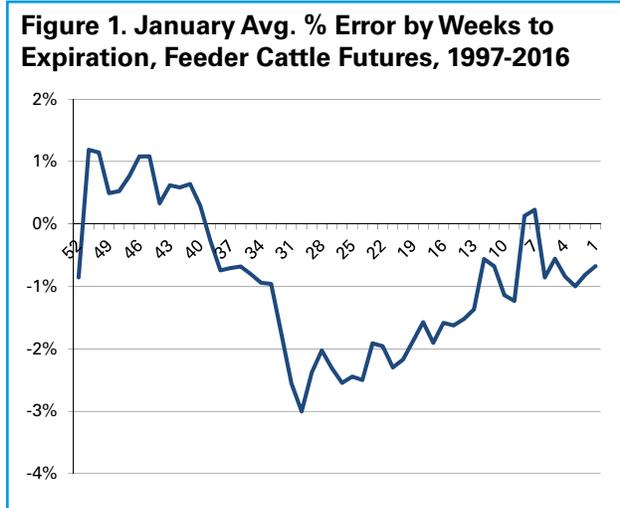

Figure 1. January Avg. % Error by Weeks to Expiration, Feeder Cattle Futures, 1997-2016

Figure 2. March Avg. % Error by Weeks to Expiration, Feeder Cattle Futures, 1997-2016

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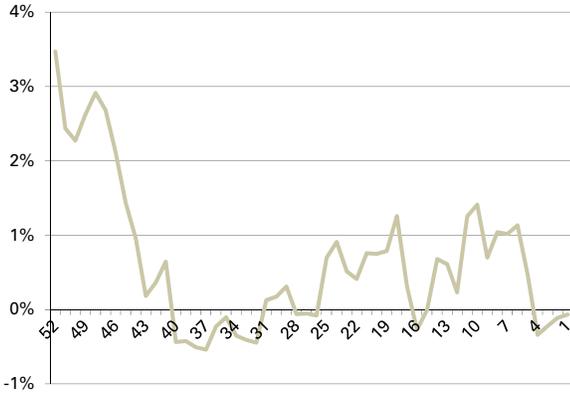

Figure 6. September Avg. % Error by Weeks to Expiration, Feeder Cattle Futures, 1997-2016

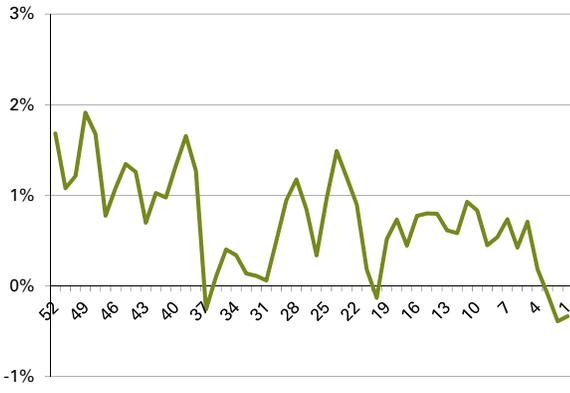**Figure 4. May Avg. % Error by Weeks to Expiration, Feeder Cattle Futures, 1997-2016**

Figure 7. October Avg. % Error by Weeks to Expiration, Feeder Cattle Futures, 1997-2016
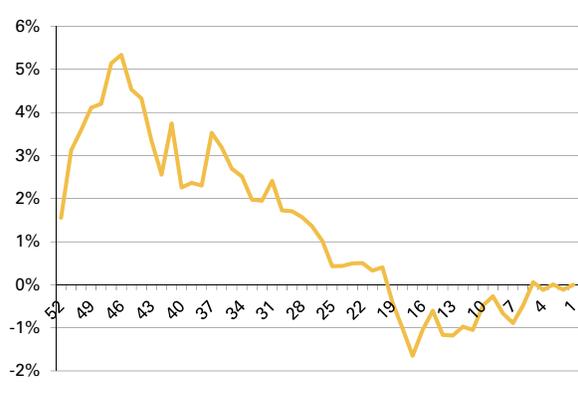

Figure 5. August Avg. % Error by Weeks to Expiration, Feeder Cattle Futures, 1997-2016
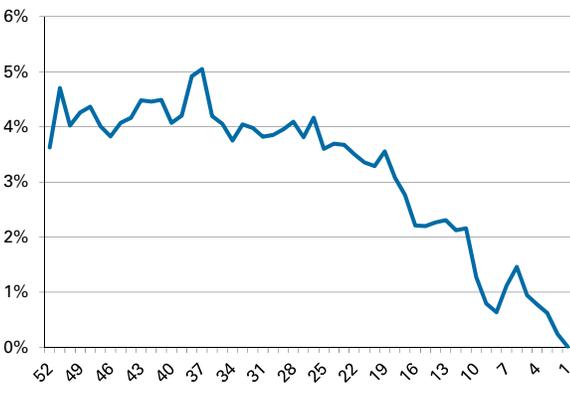

Figure 8. November Avg. % Error by Weeks to Expiration, Feeder Cattle Futures, 1997-2016

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

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	-0.9%	14.9%	7	46.7%	8	53.3%
39	-0.3%	11.6%	11	52.4%	10	47.6%
26	-2.5%	10.8%	12	57.1%	9	42.9%
13	-1.4%	5.4%	13	61.9%	8	38.1%
1	-0.7%	3.0%	9	42.9%	12	57.1%

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

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	1.0%	14.4%	7	50.0%	7	50.0%
39	-1.3%	12.1%	8	42.1%	11	57.9%
26	-0.4%	7.8%	10	50.0%	10	50.0%
13	0.4%	7.1%	10	50.0%	10	50.0%
1	0.1%	0.5%	8	40.0%	12	60.0%

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

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	3.5%	16.1%	7	41.2%	10	58.8%
39	-0.4%	12.5%	7	36.8%	12	63.2%
26	-0.1%	9.4%	10	50.0%	10	50.0%
13	0.6%	7.7%	8	40.0%	12	60.0%
1	-0.1%	0.4%	10	50.0%	9	45.0%

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

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	1.7%	19.0%	5	38.5%	8	61.5%
39	1.7%	12.2%	6	33.3%	12	66.7%
26	0.3%	9.5%	11	55.0%	9	45.0%
13	0.6%	7.6%	11	55.0%	9	45.0%
1	-0.3%	0.9%	11	55.0%	8	40.0%

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

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	3.6%	15.2%	7	46.7%	8	53.3%
39	4.2%	11.6%	6	30.0%	14	70.0%
26	4.2%	10.2%	4	20.0%	16	80.0%
13	2.3%	6.3%	7	35.0%	13	65.0%
1	0.0%	0.3%	11	55.0%	9	45.0%

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

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	3.7%	16.2%	6	40.0%	9	60.0%
39	3.9%	12.6%	8	42.1%	11	57.9%
26	2.7%	10.7%	7	35.0%	13	65.0%
13	-0.3%	6.0%	12	60.0%	8	40.0%
1	0.0%	0.5%	6	30.0%	14	70.0%

Table 7. Each Week's Price Compared to the Expiration Price, Feeder Cattle, October Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	1.6%	20.8%	5	41.7%	7	58.3%
39	2.4%	13.8%	8	40.0%	12	60.0%
26	1.0%	10.9%	8	40.0%	12	60.0%
13	-1.2%	8.8%	9	45.0%	11	55.0%
1	0.0%	0.4%	10	50.0%	10	50.0%

Table 8. Each Week's Price Compared to the Expiration Price, Feeder Cattle, November Contract, 1997-2016

Weeks Out	Average Error	St. Dev.	Years Above	% of Years Above	Years Below	% of Years Below
52	-2.3%	21.4%	7	53.8%	6	46.2%
39	1.0%	13.2%	10	50.0%	10	50.0%
26	-1.2%	12.2%	10	50.0%	10	50.0%
13	-2.3%	9.1%	11	55.0%	9	45.0%
1	-0.1%	0.6%	8	40.0%	12	60.0%

Table 9. Overall effectiveness of contracts as predictors of expiration prices

	Average % Error	Average St. Dev.	Total Weeks Above	% Weeks Above	Total Weeks Below	% Weeks Below
January	-0.9%	9.8%	556	52.2%	509	47.8%
March	0.3%	9.3%	436	43.9%	558	56.1%
April	0.6%	9.9%	452	45.2%	547	54.7%
May	0.7%	10.2%	464	46.9%	524	52.9%
August	3.1%	9.7%	345	33.8%	676	66.2%
September	2.4%	10.2%	413	40.9%	598	59.1%
October	1.2%	11.2%	429	43.1%	566	56.9%
November	-0.7%	11.3%	518	51.1%	496	48.9%
Overall	**0.8%**	**10.2%**	**3613**	**44.6%**	**4474**	**55.3%**

It is important to know more than the average about the forecast errors. Tables 1-8 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. March, April, May, August, September, and October contracts tended to have more years where the weekly prices were below the expiration price, which indicates under prediction. January, November 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 9 provides analysis on the overall effectiveness of the contracts as predictors of expiration prices. As shown by the very small average errors (1.3 percent of $135/cwt is $1.76/cwt), the contracts are very accurate. The most accurate month on average was March followed by April, May, November, and January. The least variable months were March, August, January, and April.

This analysis is intended to provide some insight into how accurately Feeder 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.