Risk Management for Cattle Feedlots: Futures Buy and Sell Signals

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In recent years, narrow profit margins in the cattle feeding business have increased the necessity of effectively managing risk, but especially price risk. The live cattle futures market, started in the mid-1960s, is an effective tool in price risk management; a fact that more Iowa cattle feeders are realizing. Some producers however are hesitant to use futures positions, charging that futures are too complicated to use, margin calls are an added burden, and there is a lack profit potential. These perceived challenges discourage some cattle growers from utilizing a variety of risk management tools. The fact is, futures markets are very efficient, and there is not a simple, profitable strategy that will work every time. But there are strategies that can narrow the wide array of marketing alternatives into a more manageable set of choices to evaluate.

In a separate paper, "Live Cattle Futures and Options, How Have They Done," alternative marketing tools for cattle feeders are evaluated over a 16-year period. The evaluation examined the percentage of time that futures and options strategies achieved breakeven plus or minus a fixed amount. The analysis in that paper assumed that the producer made one decision at the start of the feeding period, i.e., when the cattle go into the feedlot, and that he/she held that market position until the cattle were sold six months later. This simplified analysis allowed alternative strategies to be compared fairly.

In reality, a producer can make marketing decisions any day that the market is open. The decision then becomes one of market timing—*when* to buy or sell a futures contract to reduce price risk or insure increase the net price receivable. This study evaluates alternative market timing decision rules—more specifically, moving average (MA) strategies—to determine when to enter or exit the futures market. Following a brief description of moving average procedures is a comparison of 42 different MA combinations over 16 years of data and two time horizons.

Market timing signals

The futures market, as efficient as it is, can adjust very quickly to information. It is nearly impossible for a trading strategy to remain successful for very long. Traders begin to use the information to make buy and sell decisions. As more people use the information, the results become more diluted.

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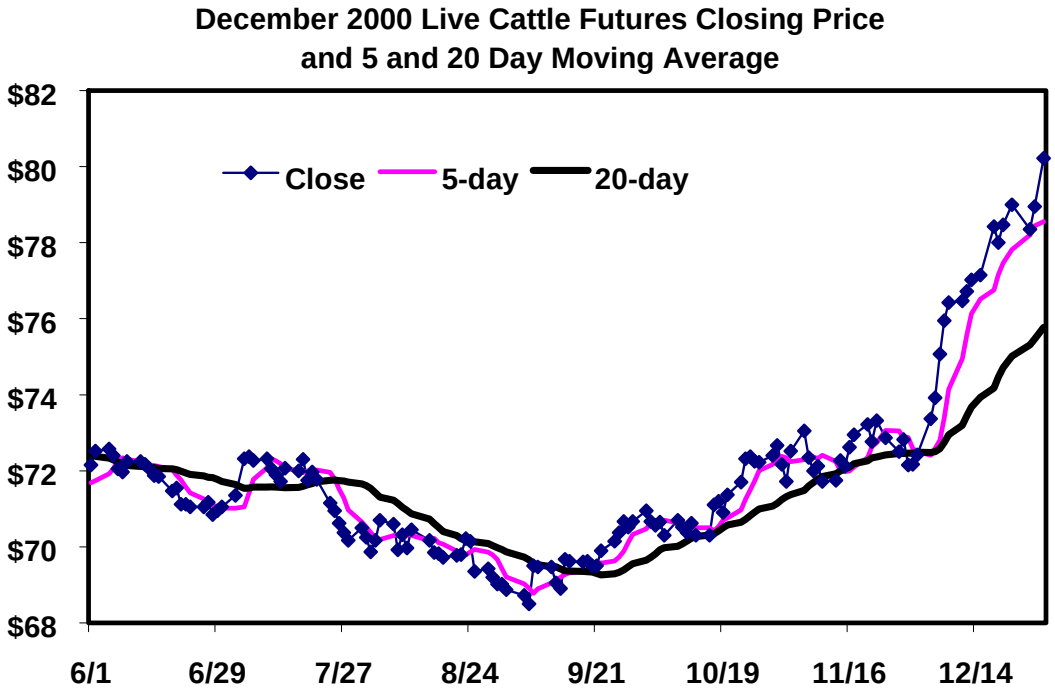
Market timing and technical trading rules are no different. These trading decisions are often simple enough to be programmed into a computer and are automatically exercised if the trading rule is triggered. While technical trading rules like MA may not be able to beat the market consistently, they do indicate market trends and a directional change in the trends.

A moving average is a simple average of closing futures prices over a given period of time, i.e., five days. A new MA can be calculated by removing the oldest price and adding the newest price to the average. Moving average trading rules involve a short-term MA (e.g., 5 days) and a long-term MA (e.g., 20 days). The MA numbers can be plotted on a graph (Figure 1). The short-term MA will change direction more quickly than the long-term MA. Yet, the short-term MA still averages several days together to remove the day-to-day market noise. A change in market direction is signaled when the short-term crosses the long-term MA. For example, if the short-term MA crosses the long-term from below it signals an upturn in the price trend. If the short-term MA crosses from above, it signals a downturn in the trend.

Figure 1.



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The combination of short-term and long-term MAs acts as a filter for market signals and determines how quickly one reacts to those signals. The trade-off is that the fewer the days included in the MA, the more often the market will trigger a trade, and the more often a commission is paid. The

more days included in the MA, the fewer the number of trades will be signaled. There will be fewer trades, but there may also be missed opportunities. Which combination of short-term and long-term MAs is most profitable and least risky? That is the focus of this analysis and report.

Procedures

Daily futures prices for the Live Cattle futures contracts were examined using 192 months of sales data from 1989-2004. All six contract months were used and evaluated for a producer who was selling fed cattle on or near the 15th of each month after they had been on feed six months (yearlings). Cost of production for the producer was assumed to be equal to that shown by the Iowa State University Extension Estimated Livestock Returns for the appropriate marketing month. A total of 42 different short-term–long-term combinations were considered in the analysis for a short hedger. Table 1 summarizes the results; the full results can be found at http://www.econ.iastate.edu/faculty/lawrence/Acrobat/CattleAverageLink.pdf.

Results from alternative moving average futures strategies

Table 1 ranks the strategies by hedging returns (combined cash and futures) and lists the five most profitable MA combinations by selling month for the time period evaluated, and shows the average return ($/cwt) for a hedger following the strategy. It also lists a *risk ranking* for each strategy. The 25th percentile cutoff is the measure of risk used and is defined as the 16-year average return at the 25th percentile. That is, 25 percent of the time, returns were less than this number; 75 percent of the time, returns were greater than this number. Producers can thus decide if they can risk a 1 in 4 chance of a lower return. The risk ranking lists the 25th percentile value for each strategy from highest to lowest. A higher 25th percentile value means that the MA strategy has a higher and more preferable risk ranking.

Although somewhat arbitrary, Table 1 lists the five most profitable strategies and their risk ranking out of the 42 combinations. A “good” strategy is one that has a high average return and low risk (a 1 or 2 on both scales). For example, with May marketings over a 6-month hedging period, the #1 ranked average return was ranked #32 on risk, the 15-42 day combination. However, the #2 strategy in returns was #9 on risk (12-42 day combination), suggesting that giving up a small amount of average return was accompanied by a less risky strategy. Note that no single strategy is the best in every month; some work better than others in certain months. In some months the cash market compared well to the futures strategies, but was less favorable in other months. Also, there is very little difference in the average returns of the top five strategies in some cases.

How to read the table

- Selling Date – Month in which you will be selling your cattle.
- Average Hedge Ranking – Ranks the average return from hedging over ten years. A #1 ranking means that that strategy returned the highest average hedge return over ten years out of 42 strategies.
- Strategy – The combination of short-term and long-term moving average ranked in the top five according to average net hedge.
- Average Net Hedge – Gives the average hedging return ($/cwt live weight**)** dollar amount that was gained or lost if you had used that strategy over ten years.
- Risk Ranking – Returns the ranking according to 25th percentile. That is, returns were less than this number 25 percent of the time, and greater than this number 75 percent of the time. A ranking of #1 means that, out of 42 strategies, that strategy was the least risky.
- 25th Percentile – Gives the return that resulted 25% of the time. In other words, 75% of the time you will receive a higher return than the number listed.

How to use this table

1. Determine if hedging with futures is appropriate for the operation and the time period considered. The report "Live Cattle Futures and Options, How Have They Done " compares futures contracts to alternative options strategies by profit objectives and selling month.
2. Locate the month in the selling date column in which you will be selling your cattle.
3. Consider either a 6-month or a 10-month time frame to match your feeding period. This report only contains results for a 6-month time frame. The 10-month is currently being updated.
4. Locate the results. For example, if you plan on selling your fed cattle in August after a 6-month feeding period, you have a couple of options. The 18-48 day strategy ranks first in average hedge return, but second in risk. The 18-30 strategy ranks second in average hedge return, but first in risk. Both strategies could not out perform the cash market, but fared much better by reducing the risk of the cash market in half.

Live Cattle Futures Results From Alternative Hedging Strategies For Years 1989-2004.

Selling Date	Hedge Ranking	Strategy	6-Month Hedges Avg. Net Hedge	Risk Ranking*	25% Percentile
February Contracts					
Jan. 15	1	12-48 day	2.18	21	-3.24
	2	9-42 day	2.09	8	-3.50
	3	12-50 day	1.97	19	-3.17
	4	9-24 day	1.92	22	-3.28
	5	9-36 day	1.88	13	-2.92
		Cash only	2.22		-1.36
Feb. 15	1	12-48 day	2.30	22	-2.09
	2	12-50 day	2.10	4	-1.30
	2	12-30 day	2.10	11	-1.38
	4	15-48 day	1.88	1	-1.16
	5	18-48 day	1.76	15	-1.61
		Cash Only	2.41		-1.71
April Contracts					
Mar. 15	1	15-30 day	3.89	1	0.52
	2	15-27 day	3.70	14	-0.11
	3	18-36 day	3.66	25	-0.95
	3	18-30 day	3.66	26	-1.05
	5	15-42 day	3.65	8	0.14
		Cash Only	4.70		1.18
Apr. 15	1	15-42 day	4.48	1	2.10
	2	18-36 day	4.36	7	0.75
	3	15-36 day	4.33	5	0.84
	4	18-42 day	4.17	16	-0.97
	5	12-42 day	4.05	3	1.72
		Cash Only	4.48		0.26
June Contracts					
May 15	1	15-42 day	3.52	32	-1.93
	2	12-42 day	3.33	9	-0.08
	3	15-24 day	3.27	19	-0.96
	4	18-42 day	3.19	31	-1.90
	5	18-36 day	3.09	25	-1.52
		Cash Only	2.34		-1.93
Jun. 15	1	15-42 day	2.10	19	-1.16
	2	15-36 day	1.88	4	-0.53
	3	18-42 day	1.85	7	-0.71
	4	12-42 day	1.76	12	-0.92
	5	18-48 day	1.71	20	-1.24
		Cash Only	0.79		-2.10

Live Cattle Futures Results From Alternative Hedging Strategies For Years 1989-2004.

Selling Date	Hedge Ranking	Strategy	6-Month Hedges Avg. Net Hedge	Risk Ranking*	25% Percentile
August Contracts					
Jul. 15	1	12-24 day	0.64	3	-1.19
	2	12-36 day	0.63	1	-0.57
	3	15-36 day	0.62	7	-1.42
	4	15-27 day	0.33	18	-2.52
	5	12-30 day	0.32	5	-1.34
		Cash only	-0.99		-3.45
Aug. 15	1	18-27 day	-0.41	3	-4.46
	2	18-30 day	-0.43	2	-4.20
	3	18-24 day	-0.79	1	-3.06
	4	12-36 day	-1.05	19	-6.50
	5	12-24 day	-1.13	5	-5.58
		Cash only	-6.90		-4.83
October Contracts					
Sep. 15	1	15-36 day	0.20	1	-0.87
	2	18-30 day	-0.10	2	-1.18
	3	15-42 day	-0.10	3	-1.85
	4	18-27 day	-0.31	12	-3.59
	4	18-36 day	-0.36	16	-3.95
		Cash only	-0.78		-4.78
Oct. 15	1	3-30 day	-0.57	8	-4.57
	2	5-24 day	-0.69	21	-5.61
	3	5-30 day	-0.72	27	-6.03
	4	5-36 day	-0.76	15	-5.15
	4	15-36 day	-0.91	2	-2.87
		Cash Only	-0.65		-4.73
December Contracts					
Nov. 15	1	18-27 day	-0.46	8	-4.77
	1	15-36 day	-0.54	13	-5.27
	3	18-36 day	-0.59	1	-3.74
	4	15-30 day	-0.64	15	-5.34
	4	18-30 day	-0.69	14	-5.28
		Cash only	-0.08		-4.16
Dec. 15	1	15-27 day	0.30	11	-5.72
	2	15-30 day	-0.23	9	-5.65
	3	12-42 day	-0.35	20	-6.18
	4	15-36 day	-0.37	8	-5.63
	5	15-42 day	-0.53	13	-5.83
		Cash only	-0.44		-4.33

*42 different moving average day combinations based on 25th Percentile