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Timing Feeder Cattle Hedges Through Point-and-Figure Analysis

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Timing Feeder Cattle Hedges Through Point-and-Figure Analysis

John R. Franzmann and Jerry D. Lehenbauer*

Agricultural economists are well aware of the importance of good price forecasts in making many economic decisions. To this end, effort is expended to meld economic and statistical theory into models with the capacity for accurate forecasting. Not all decisions, however, require a "complete" forecast. By a "complete" forecast we mean one that includes both magnitude and direction of change. Since price forecasts are usually generated stochastically, the "complete" forecast would also include a confidence interval about the point estimate.

Hedging decisions by cattlemen are one type of decision that may be made without the use of a price forecast. The cattle hedger need only know when market price is making a significant change in direction. Although knowledge of the magnitude of the change would certainly be desirable, it is not absolutely necessary. Hedgers, therefore, require methods that indicate when market turning points have recently occurred or are imminent.

Agricultural economists have so concentrated their research on econometric modeling that they have largely ignored a set of simple, yet effective, tools of analysis applicable to speculative type markets. These tools are generally referred to as the methods of "technical analysis."

Point-and-Figure Analysis

Point-and-figure analysis is one of the technical tools most commonly used by market traders. It has its roots in the stock market but was quickly adapted to the commodities area in part, no doubt, because of its simplicity.

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Table 1. Daily high and low prices of October 1978 Feeder Cattle Futures March 6, 1978-March 17, 1978.

Date	High	Low
	$/cwt.	
March 6	53.00	51.50
7	54.40	53.10
8	54.80	52.77
9	54.35	53.15
10	53.85	52.80
13	54.90	54.00
14	54.97	54.40
15	54.80	53.85
16	54.70	53.20
17	54.40	52.90

Point-and-figure analysis is a graphic tool. The construction of a graph is illustrated in Figure 1 using the data from the March 1978 Feeder Cattle contract (Table 1). Using a piece of graph paper, such as the K&E 46 0700 10x10 to the inch, construct a price scale along the vertical axis using, say, two cents per cwt per inch. Each minor division, therefore, represents $0.20 per cwt which has been a commonly used unit.

The analyst is concerned only with the daily high, the daily low and the extent of price change in the event where a new high or a new low fails to materialize. Starting with March 6, note that the range for the day is $51.50 per cwt to $53.00 per cwt. Since the market is in an uptrend, place an X in each square from $51.60 per cwt through $53.00 per cwt. On March 7, a new high was achieved and seven additional squares are plotted. On the eighth, a new high was reached and plots were made through $54.80 per cwt. March 9 failed to produce a new high, so the low is checked. The low of $53.15 per cwt is subtracted from the recent high of $54.80 per cwt; the difference is $1.65.

To reverse a trend, point-and-figure analysts require that upon failure of a new high the market must reverse by a prescribed amount which is equal to or greater than the product of the box size and the reversal number. The reversal number is an arbitrary integer chosen by the analyst. A common reversal number has been three. A drop of $0.20x3 yields a requirement of $0.60 per cwt for a reversal of the minor trend; the decline of $1.65 per cwt exceeds this amount. Therefore, 0's are plotted one column to the right and beginning one square below the highest square plotted. Although the price dropped below the $53.20 per cwt square, it could not fill the $53.00 per cwt square; therefore, no entry is made in the latter square on March 9.

Price fell to a new low on the tenth so the squares down to and including $52.80 per cwt are plotted with zeroes. Following the foregoing rules, the remaining data resulted in an upside reversal to the $54.80 per cwt square which was then followed by a downside reversal to the $53.00 per cwt square. Note that on March 14, price did not quite reach the $55.00 per cwt level so plotting stopped in the $54.80 per cwt square. Similarly on March 17, although price penetrated the $53.00 per cwt level, it did not drop far enough to fill the $52.80 per cwt square.

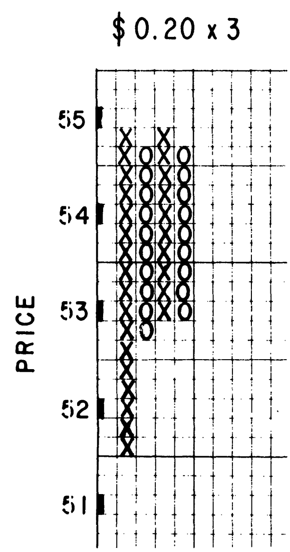

Figure 1. Feeder Cattle Futures, March 6, 1978 - March 17, 1978.

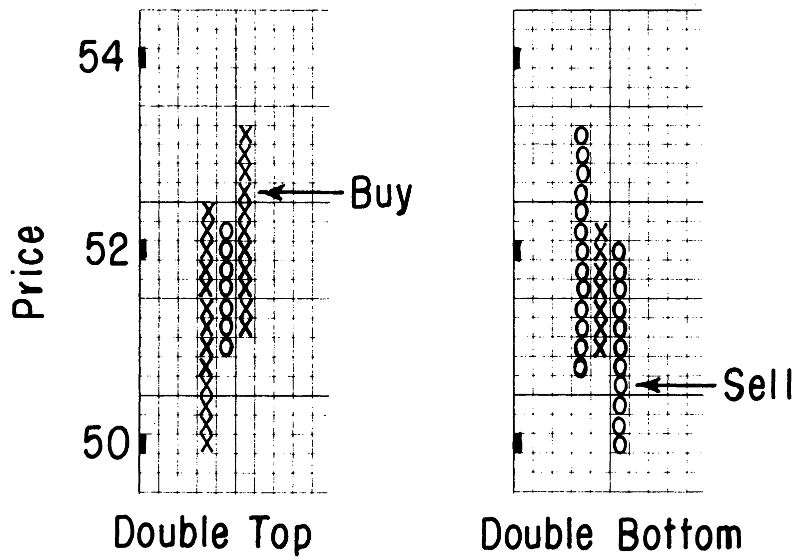

Figure 2. The simple buy and simple sell.

Signals to buy or sell contracts are revealed by the market action subsequent to consolidation or congestion phases in the market consisting of two or more reversals of minor trend. The simplest case occurs where the two minor reversals result in a Double Top or Double Bottom. Penetration of the Double Top results in a buy signal. Penetration of a Double Bottom results in a sell signal. These two simple formations and the associated action points are illustrated in Figure 2. More complex formations have been defined by point-and-figure analysts but were not employed in the results that follow; hence, they are not elaborated upon here.

Parameter Optimization

The patterns that evolve throughout the market history and, therefore, the appearance of buy/sell signals are a function of the two point-and-figure parameters—the box size and the reversal number. Large box sizes coupled with large reversal numbers will generate few buy/sell signals over the life of a contract. Small box sizes employed with small reversal numbers will generate and produce a large number of buy/sell signals.

It would appear logical that there should exist an optimum parameter set; nonetheless, little published research has appeared on the subject. Thiel and Davis [1] investigated a combination of 28 box sizes and reversal numbers for two delivery periods of 16 commodities over the time period 1960-69. Their results indicated that significant improvements over the traditional three-box reversal method could be obtained through optimization.

Zieg and Kaufman [2] examined 23 commodities using a 135 day trading period as the optimization interval. Their results also indicated that significant improvements were possible through optimization of the parameter set. Dollar profits and rate of return on margin were increased on the order of 100 percent.

In the published work, there are no analyses of feeder cattle contracts. Live cattle contracts are included, but it should not be automatically assumed that the optimal parameter configuration will be the same for both commodities. A separate optimum can logically be expected for each commodity. In fact, Zieg and Kaufman go so far as to suggest that "an optimized system requires that optimal values be selected for each delivery month for each commodity, and these values must be periodically re-evaluated."[1] Their research, however, leaves unanswered the question of what constitutes the optimum length of time over which to optimize the two parameters.

Feeder Cattle Optima

The feeder cattle optima were estimated as an average over the entire time-history of feeder cattle contracts. The data set consisted of March, May and October contracts beginning with the 1972 contract year and ending with the 1977 contract year. The size of the open position was limited to one 42,000 pound contract for each delivery month at any point in time.

In this study, optimum was defined as that combination of box size and reversal number yielding the highest profits for the entire set of 18 contracts, after an allowance for commission charges of $50.00 per trade.

Each of eight box sizes from $0.05 to $0.40 in $0.05 multiples was tested with reversal numbers from one through five inclusive. The $0.05 box size was also tested with a six box reversal giving a total of 41 different box size-reversal number combinations. Testing of additional parameter combinations did not appear promising over the time span that was investigated.

To keep the simulation realistic, certain trading rules were imposed:

1. No trades were transacted when the high and low prices were equal, assuming no trades occurred for the contract on such days.[2]
2. No trades were allowed when the transaction price was equal to a limit move price.
3. If the price range gapped above or below a buy or sell signal, respectively, the closing price was used unless it was a limit move price. In such cases, no trades were made for the day.
4. Because of the threat of delivery, no new buy signals were honored after the first of the delivery month.

Table 2 reports the results of the 41 different box size-reversal number combinations. The greatest total net profit occurred with a $0.05 box size and a five box reversal. However, the top five ranking parameter combinations were relatively close, all having total net profits in excess of $54,000. Most of this profit was not the result of a single unusual year, although profits did vary widely among years (Table 3).

In general for any given box size, net profits decreased as the reversal number increased. Larger reversal numbers tend to produce larger losses before a position is liquidated, violating a trade maxim of cutting losses quickly. Also, out of the best 15 combinations only one combination, the $0.40x1, had a box size greater than $0.20. Clearly, the better parameter combinations tended to have both a small box size *and* a small reversal number. As might be expected, these parameter combinations also produced a large number of trades, but the percent of profitable trades was not noticeably affected. Even though the number of false signals was increased, the small box size and reversal numbers resulted in smaller losses for each of the false signals.

Net profits from long trades were greater than net profits from short trades for the better parameter combinations, even though the number of long and short trades was

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[1]Zieg, Kermit C. Jr., and Perry J. Kaufman. "Optimized Point-and-Figure Charting," *Commodities*, September, 1974, p. 20.

[2]Trading does actually occur on such day but the volume is small and the probability of an order execution is low. The rule imposed is a technique to aid in avoiding overstating profits.

Table 2. Net profits in dollars from the feeder cattle futures market using point-and-figure charts, 1972-1977.

Box Size in $/cwt.	Reversal Distance in Boxes	Net Profits from Long Trades	Net Profits from Short Trades	Total Net Profits	Rank Based on Total Net Profits	Total Number of Trades	Percent Profitable Trades
.05	1	28,328	23,171	51,499	10	272	41.2
.05	2	28,906	24,001	52,907	8	262	41.6
.05	3	28,439	23,025	51,464	11	256	41.8
.05	4	30,348	25,257	55,605	3	245	43.3
.05	5	30,837	25,767	56,604	1	235	44.7
.05	6	29,895	24,405	54,300	5	229	44.5
.10	1	28,098	23,033	51,131	12	266	42.7
.10	2	29,108	23,913	53,021	6	245	43.7
.10	3	29,226	23,757	52,983	7	223	44.4
.10	4	26,212	21,950	48,162	15	214	44.4
.10	5	25,410	20,854	46,264	17	194	45.9
.15	1	30,457	25,616	56,073	2	251	45.0
.15	2	28,209	23,489	51,698	9	224	46.4
.15	3	25,143	20,220	45,363	18	199	45.7
.15	4	25,010	22,679	47,689	16	166	48.8
.15	5	20,129	19,179	39,308	25	140	47.1
.20	1	29,778	24,839	54,617	4	234	43.6
.20	2	26,667	22,320	48,987	13	198	44.9
.20	3	22,528	18,700	41,228	21	162	45.1
.20	4	19,995	20,502	40,497	23	119	47.9
.20	5	11,205	12,334	23,539	31	101	46.5
.25	1	24,255	19,859	44,114	20	235	43.8
.25	2	22,640	17,739	40,379	24	181	44.8
.25	3	20,296	17,406	37,702	27	135	47.4
.25	4	10,273	10,302	20,575	32	105	54.7
.25	5	5,938	10,007	15,945	33	79	46.8

Table 2. Continued.

Box Size in $/cwt.	Reversal Distance in Boxes	Net Profits from Long Trades	Net Profits from Short Trades	Total Net Profits	Rank Based on Total Net Profits	Total Number of Trades	Percent Profitable Trades
.30	1	21,915	17,279	39,194	26	212	43.4
.30	2	24,153	20,941	45,094	19	146	46.6
.30	3	11,823	12,806	24,629	30	106	46.2
.30	4	3,859	6,681	10,540	35	81	44.4
.30	5	−5,455	423	−5,032	40	62	37.1
.35	1	22,893	18,319	41,212	22	184	45.1
.35	2	17,585	18,062	35,647	28	120	46.7
.35	3	4,197	8,804	13,001	34	90	43.3
.35	4	−810	5,366	4,556	36	63	44.4
.35	5	−8,326	−226	−8,552	41	48	37.5
.40	1	25,867	22,443	48,310	14	164	45.7
.40	2	14,722	12,146	26,868	29	108	48.1
.40	3	−4,050	2,281	−1,769	38	72	37.5
.40	4	−5,625	3,175	−2,450	39	48	39.6
.40	5	−2,260	3,005	745	37	37	35.1

Table 3. Yearly distribution of feeder cattle futures profits, in dollars, from selected point-and-figure chart parameters, 1972-1977.

Parameters	1972	1973	1974	1975	1976	1977	Average
.05x5	5,637	17,477	17,552	2,866	11,318	1,754	9,434
.15x1	4,177	14,846	19,878	−361	12,151	5,382	9,346
.40x1	3,099	12,710	16,554	4,908	13,263	−2,224	8,052
.20x3	2,973	14,283	16,512	3,745	8,333	−4,618	6,871

about equal. The reverse was true for those parameter combinations having low or negative total net profits.

It was evident during the six-year period that larger box sizes and reversal numbers gave better results for some of the contracts. For example, in 1975, both the $0.40x1 and the $0.20x3 parameter sets were definitely superior to either the $0.05x5 or the $0.15x1 combinations. An attempt was made to find a variable that would indicate when the parameters would need to be re-optimized. The two possibilities examined were the variance of the closing prices and the variance of the daily range between the high and low. Neither of these produced promising results.

Stops

Under a premise that parameter sets with larger box sizes and reversal numbers might achieve a higher ranking if losses could be cut sooner, the use of stops was tested. Various sizes of stops were tested for each of selected parameter combinations until a maximum total net profit was obtained. Whenever price moved a specific amount against the entry price, the trade was "stopped out" at that specified price. For example, if a $1.00 stop was specified and a long position was established at $58.00, the position was automatically closed out at $57.00 if the price ever fell to $57.00 or lower. If the daily price range gapped above a below the stop price, then the closing price was used to close out the position.

Incorporation of a stop increased total net profits for each of the selected parameter combinations except for the $0.05x5 combination (Table 4). In all cases, the most profitable size of a stop resulted in a large percentage of the trades being stopped out. Another noticeable result was that most of the increase in total net profits was because of increased profits from long trades. In fact, net profits from short trades were decreased with some stops.

A. Buy signal at $39.40.
B. Long position stopped out at $42.00.
C. Sell signal at $40.80
D. Short position stopped out at $39.40.
E. Buy signal at $39.80.

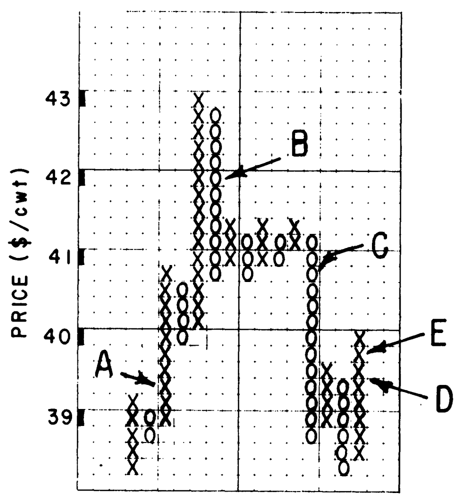


Figure 3. Example of a $1.00 trailing stop used with a $0.20x1 point-and-figure chart.

Table 4. Net profits in dollars from the feeder cattle futures market using point-and-figure charts with stops, 1972-1977.

Box Size in $/cwt.	Reversal Distance in Boxes	Size of Stop in $/cwt.	Net Profits from Long Trades	Net Profits from Short Trades	Total Net Profits	Total Number of Trades	Percent Profitable Trades	Percent of Trades Stopped Out
.05	5	.60	30,785	24,343	55,128	272	36.4	50.7
.05	5	.65	30,751	24,640	55,391[a]	267	37.1	48.7
.05	5	.70	30,901	24,446	55,347	262	38.2	46.6
.15	1	.25	36,126	23,274	59,400	317	33.4	64.0
.15	1	.30	35,131	24,657	59,788[a]	310	34.5	62.3
.15	1	.35	34,765	23,418	58,183	310	34.8	60.0
.20	1	.70	32,642	25,038	57,680	257	38.5	47.1
.20	1	.75	31,831	27,417	59,248[a]	251	39.4	43.8
.30	1	.80	31,788	26,473	58,261	250	39.6	43.2
.20	3	.00	27,154	18,866	46,020[a]	223	30.0	71.7
.20	3	.05	27,069	18,488	45,557	222	28.8	70.3
.20	3	.10	26,376	18,106	44,482	222	28.8	70.3
.40	1	1.10	27,436	24,469	51,905	173	42.2	39.9
.40	1	1.15	28,228	24,415	52,643[a]	171	42.7	37.4
.40	1	1.20	27,745	24,226	51,971	171	42.7	37.4

[a]Denotes maximum total net profits for each box size-reversal number combination.

The use of a trailing stop was also examined. The trailing stop, as used here, means that the stop is placed a set amount below any new high that is plotted. A $1.00 trailing stop is illustrated in Figure 3.

The same parameter combinations selected for testing the ordinary stop were also used for testing the trailing stop. Use of the trailing stop increased the total net profits for each of the selected parameter combinations (Table 5) when compared with the total net profits without use of stops. However, the only substantial increase in total net profits occurred with the $0.40x1 combination. Generally, most of the increase in total net profits was because of increase in net profits from short trades, a result opposite that of the ordinary stop. One exception was the $0.40x1 combination which had considerably greater improvement in net profits from the long trades.

Hedging Strategies

Fundamental indications in 1978 point to higher feeder cattle prices for the next several years. However, upward trending feeder cattle prices will not eliminate the high level of risk faced by feeder cattle producers. Furthermore, it is not likely that feeder cattle prices will be as stable as the period from the mid-60's through 1971. Seasonal supply and demand for feeder cattle coupled with variable weather conditions, fluctuating grain prices and other factors can result in profitable hedging opportunities. Because of the expected instability of price, producers will need to consider both the short hedge as well as the long hedge over the next several years.

Production Alternatives

Three basic production situations representative of Northcentral and Northwestern Oklahoma were simulated to test the alternative hedging strategies. The costs and revenues using actual cash prices were simulated over a six-year period beginning in November 1971, and ending in October 1977, for each of three production alternatives. Five hedging strategies were tested with each production alternative. The stream of net returns from the production activities was combined with the futures market profits from each of the hedging strategies to arrive at a combined average return and standard deviation figure for each alternative.

The following costs were used for the production simulations:

1. A 400 to 500 pound choice stocker steer at Oklahoma City at the average weekly price for these calves.
2. Operating inputs including hay, protein supplement, starter feed, salt, vet and medicine, trucking, sales commission and other miscellaneous expenses, plus labor costs and the ownership costs of machinery and equipment. The amounts and prices for these items were taken directly from enterprise budgets prepared by the Area Farm Management Extension Specialists in Northcentral and Northwestern Oklahoma.
3. Interest on the operating costs in (1) and (2) at the interest rates indicated in the enterprise budgets.
4. Commission and interest on the initial margin requirement[3] for a feeder cattle futures contract. A commission of $50 per trade was subtracted from the returns. An $800 initial margin requirement was used. The same interest rates used in (3) were used to calculate the interest charges on the margin requirement.

[3]The commissions and margin requirements vary among firms and over time. The values chosen for use in the simulation are arbitrary.

Table 5. Net profits in dollars from the feeder cattle futures market using point-and-figure charts with trailing stops, 1972-1977.

Box Size in $/cwt.	Reversal Distance in Boxes	Size of Stop in $/cwt.	Net Profits from Long Trades	Net Profits from Short Trades	Total Net Profits	Total Number of Trades	Percent Profitable Trades	Percent of Trades Stopped Out
.05	5	1.45	31,127	28,134	59,261	260	43.1	52.7
.05	5	1.50	31,232	28,667	59,899[a]	259	42.9	49.4
.05	5	1.55	32,453	26,545	59,998	255	44.3	48.6
.15	1	1.35	30,634	27,108	57,742	276	44.6	48.6
.15	1	1.40	31,162	26,864	58,026[a]	273	43.2	45.8
.15	1	1.45	30,990	26,528	57,518	272	43.4	42.3
.20	1	1.35	29,291	27,071	56,362	260	43.8	54.6
.20	1	1.40	30,982	25,895	56,877[a]	256	43.8	51.6
.20	1	1.45	30,524	25,790	56,314	255	44.3	46.7
.20	3	1.40	23,889	19,865	43,754	124	46.8	75.0
.20	3	1.45	23,108	21,619	44,727[a]	119	48.7	71.4
.20	3	1.50	22,982	20,422	43,404	119	47.1	64.7
.40	1	1.40	30,876	22,980	53,967	183	46.4	68.3
.40	1	1.45	32,053	25,566	57,619[a]	178	48.3	63.5
.40	1	1.50	30,751	25,188	55,939	178	46.1	61.8

[a]Denotes maximum total net profits for each box size-reversal number combination

5. No charges were assessed for grazing in these simulations. All operating expenses were adjusted upward to reflect a two percent death loss.

The income from the sale of feeder steers at the end of each production period was computed from the average weekly price of choice feeder steers at Oklahoma City for the appropriate weight class during the week sold. The number of steers produced in each production situation was varied so that the total final weight of the feeder steers would be 42,000 pounds, the size of one feeder cattle futures contract.

The first production alternative simulated the situation where stocker calves are bought in the fall and grazed on small grains pasture only until the middle of March. This simulation corresponds with a farmer planning to harvest the grain. Seventy-four 400 pound stocker steers are purchased during the week of November 15 and sold at a weight of 565 pounds during the week of March 15. The March feeder cattle contract is used for hedging.

With the second production alternative, the feeder steers are allowed to graze-out the small grains pasture. Sixty-two stockers weighing 400 pounds are bought during the week of November 15 and sold at a weight of 678 pounds during the week of May 15. The May contract is used for hedging.

The final production alternative is a summer stocker simulation. Sixty-one 500 pound stocker steer calves are purchased on May 1 and are sold at a weight of 690 pounds on October 1. The October contract is used for hedging.

Short Hedge Strategies

The same trading rules and buy/sell signals used in the optimization procedure were used to place and lift the short hedges. Strategy 1 is a no-hedge strategy. It corresponds to the production activity only and serves as a benchmark to compare the effectiveness of the other strategies.

Strategy 2 is a non-selective hedging strategy. A hedge is placed at the beginning of the production process and lifted when the feeder steers are sold. This strategy will increase profits compared to the no-hedge strategy only if the futures price at the beginning of the production period is greater than at then end of the production period. However, this strategy should reduce the variability of the flow of net returns considerably. Apart from the basis risk, loss in the cash market would be offset by the lower futures prices.

Strategy 3 uses the point-and-figure charting method of technical price analysis to hedge selectively. Breakouts of the double bottom and double top formations are used to place and lift hedges, respectively. This particular strategy is based on the commonly used $0.20-box size and three-box reversal.

Strategy 4 used a $0.40-box size and a one-box reversal chart in conjunction with a $1.45 trailing stop. The $0.40-box size and one-box reversal chart has been in use by one commercial chart service. The $1.45 trailing stop was included since it increased net profits from short trades more than any other stop or trailing stop tested with the $0.40x1 parameter combination in the optimization study.

Strategy 5 is based on a $0.05x5 point-and-figure chart with a $1.50 trailing stop. This parameter combination had the highest net profits from the short trades of any combination tested in the optimization process.

Tables 6, 7 and 8 present the summary statistics for the five short hedging strategies for each of the production alternatives. Each of the technical hedging strategies proved superior to the no-hedge and the hedge-and-hold strategies in terms of the average return for the small grains production alternative.

The smaller standard deviation of return for each of the technical strategies relative to the no-hedge alternative is indicative of the risk-reducing capacity of such strategies.

Table 6. Results of simulated short hedging strategies for the small grains grazing production alternative in dollars per head, 1972-1977.

Strategy	Average Return	Change in Returns from Strategy 1	Standard Deviation of Return	Change in Standard Deviation from Strategy 1	Coefficient of Variation	Low Return	High Return
1. No Hedge	13.20	—	50.13	—	379.9%	−69.03	85.04
2. Hedge & Hold	4.67	−8.53	13.92	−36.21	298.5%	−16.15	24.28
3. .20x3	23.75	+10.55	28.80	−21.33	121.3%	−1.02	78.41
4. .40x1 ($1.45T)	29.06	+15.86	27.93	−22.20	96.1%	−1.98	78.12
5. .05x5 ($1.50T)	30.97	+17.77	22.71	−27.42	73.3%	16.00	76.03

Table 7. Results of simulated short hedging strategies for the small grains graze-out production alternative in dollars per head, 1972-1977.

Strategy	Average Return	Change in Returns from Strategy 1	Standard Deviation of Return	Change in Standard Deviation from Strategy 1	Coefficient of Variation	Low Return	High Return
1. No Hedge	49.10	—	50.80	—	103.5%	−46.48	103.34
2. Hedge & Hold	34.62	−14.48	10.08	−40.72	29.1%	21.73	49.76
3. .20x3	69.95	+20.85	36.15	−14.65	51.7%	34.94	134.54
4. .40x1 ($1.45T)	63.55	+14.45	29.46	−21.34	46.4%	29.59	106.04
5. .05x5 ($1.50T)	66.08	+16.98	35.38	−15.42	53.5%	19.85	121.41

Table 8. Results of simulated short hedging strategies for the summer stocker production alternative in dollars per head, 1972-1977.

Strategy	Average Return	Change in Returns from Strategy 1	Standard Deviation of Return	Change in Standard Deviation from Strategy 1	Coefficient of Variation	Low Return	High Return
1. No Hedge	1.90	—	53.05	—	2792.2%	−72.73	60.72
2. Hedge & Hold	17.78	+15.88	17.47	−35.58	98.3%	−2.85	35.69
3. .20x3	23.97	+22.07	24.82	−28.23	103.6%	3.20	68.73
4. .40x1 ($1.45T)	27.08	+25.18	27.72	−25.33	102.3%	−14.90	70.10
5. .05x5 ($1.50T)	[illegible]	[illegible]	[illegible]	[illegible]	114.9%	12.69	58.35

It is apparent that these strategies are more risky than a fully hedged position, but average returns are increased more than fivefold in exchange for about a doubling of risk. For some hedgers, it may be important to avoid negative returns. Where such considerations carry considerable weight, Strategy 5 performed in an outstanding manner.

The results for the small grains graze-out production alternative provide similar results. Average returns are considerably higher using the technically oriented strategies. When compared to the no-hedge strategy, average returns are greater *and* risk is reduced. Compared with a fully hedged strategy, average returns are increased but at the cost of an increase in risk.

The results for the summer stocker program follow the pattern established for each of the previous production alternatives. Average returns are higher using the technically oriented strategies, and compared with the no-hedge strategy, risk is reduced. When a contrast is made with the hedge-and-hold strategy, a trade-off must be faced between a higher average return and a higher level of risk.

Long Hedge Strategies

As the liquidation phase of the cattle cycle is completed and herd expansion is begun, the short hedge will become less useful and the long hedge will offer greater profit opportunity. In the analyses of the long hedge, a 90-day and a 180-day planning horizon were selected.

The simulation began on January 1, 1972, and ended November 14, 1977. A new planning period was started each week. The size of the open position for each period was one contract, assumed to consist of 65 head of feeder steers weighing approximately 646 pounds.

The March, April, May, August, September, October and November contracts were used for hedging. The month of the ending date of the planning period determined the month in which the hedge was placed. When the ending date fell past the fourteenth of a delivery month, the next contract was used for hedging to avoid the necessity of taking delivery.

The per head profits from the futures market were subtracted from the cost of a 646 pound feeder steer using the appropriate average weekly cash price for choice 600 to 700 pound feeder steers at Oklahoma City. The average cost per head for each strategy and the standard deviation were calculated to compare the effectiveness of the different strategies in reducing the cost and the variability over the six-year period.

The same trading rules and buy/sell signals used in the optimization procedure were used to place and lift the long hedges. Strategy 1 is a no-hedge strategy corresponding to the situation where cattle are procured at the end of the planning period. Strategy 2 is the fully hedged alternative where the long hedge is placed at the beginning of the planning period and lifted at the end of each period.

Strategy 3 uses the $0.20-box size and three-box reversal parameter. Strategy 4 uses a $0.40-box size and a one-box reversal parameter coupled with a $1.45 trailing stop. Strategy 5 is based on a $0.15-box size and a one-box reversal number coupled with a $0.25 ordinary stop. This latter combination had the greatest profits from the long trades of any combination tested in the optimization analysis.

Tables 9 and 10 present the summary statistics of the five long hedging strategies tested with the 90-day and 180-day planning horizons. All the selective strategies contributed from $7 to $20 per head to the feeding profits, depending on the particular strategy and the length of the planning horizon. Over the time period studied the hedge and hold strategy resulted in an average cost increase of $1.87 per head for the 90-day planning period while the same strategy reduced the average cost by $2.47 per head for the 180-day planning period.

Table 9. Results of simulated long hedging strategies using a 90-day planning period in dollars per head, 1972-1977.

Strategy	Feeder Steer Average Cost	Change in Avg. Cost from Strategy 1	Std. Dev. of Avg. Cost	Change in Std. Dev. from Strategy 1	Coefficient of Variation	High Cost	Low Cost
1. No Hedge	260.25	—	49.67	—	19.1%	422.58	159.92
2. Hedge & Hold	262.12	+1.87	47.64	−2.03	18.2%	438.82	162.51
3. $.20x3	252.86	−7.39	45.58	−4.09	18.0%	449.01	167.81
4. $.40x1 ($1.45T)	250.13	−10.12	42.11	−7.56	16.8%	383.82	166.06
5. $.15x1 ($.25)	249.40	−10.85	41.31	−8.36	16.6%	394.80	168.39

Table 10. Results of simulated long hedging strategies using a 180-day planning period in dollars per head, 1972-1977.

Strategy	Feeder Steer Average Cost	Change in Avg. Cost from Strategy 1	Std. Dev. of Avg. Cost	Change in Std. Dev. from Strategy 1	Coefficient of Variation	High Cost	Low Cost
1. No Hedge	260.69	—	50.74	—	19.5%	422.58	159.92
2. Hedge & Hold	258.22	−2.47	40.58	−10.16	15.7%	374.10	167.14
3. $.20.3	246.38	−14.31	40.69	−10.05	16.5%	362.43	168.58
4. $.40x1 ($1.45T)	243.13	−17.56	37.29	−13.45	15.3%	357.78	165.35
6. $.15x1 ($.25)	240.54	−20.15	34.90	−15.84	14.5%	340.39	173.36

In most respects Strategy 5, using the $0.15x1 parameter set, proved superior to any of the other strategies examined. It provided a lower average cost of feeders *and* lower degree of risk compared to the alternatives.

Summary and Conclusions

Volatile feeder cattle prices during the 1970's have dramatically pointed out the importance of the marketing decisions facing cattle producers. It is doubtful that stable and well-behaved feeder cattle prices will be experienced anytime soon. Therefore, the marketing decisions involved with the selling and buying of feeder cattle will continue to be a very important factor affecting the financial condition of the feeder cattle producer and cattle feeder.

This research assumed a primary goal of profit maximization with reduction of risk as a second important goal. Hedging in the futures market was selected as the tool for achieving these goals. Further, it was hypothesized that technical price analysis would assist the producer in determining the optimum time to place and lift hedges and, as a result, would increase profits and reduce the price risk.

The parameters for point-and-figure charts were optimized to obtain maximum net profits from the futures market. The results from the optimization of the technical tool was applied to develop selective hedging strategies for feeder cattle. Three common and realistic feeder cattle production situations were simulated to test alternative short hedging strategies, including a no-hedge strategy. To test long hedging strategies, 90-day and 180-day planning horizons were simulated for a year-round cattle feeding operation.

Based on the results obtained from the selective hedging strategies there was an effective increase in returns and smaller risk compared with a no-hedge strategy. For the short hedging strategies, the hedge-and-hold strategy provided less risk but only at a large reduction in added average returns. The technical-strategies increased the average return by more than fivefold at a cost of a doubling of risk for one production alternative. In another production alternative, however, the average returns were only doubled while the risk was three times the hedge-and-hold strategy. However, in this instance the hedge-and-hold strategy produced a smaller average return than the no-hedge alternative.

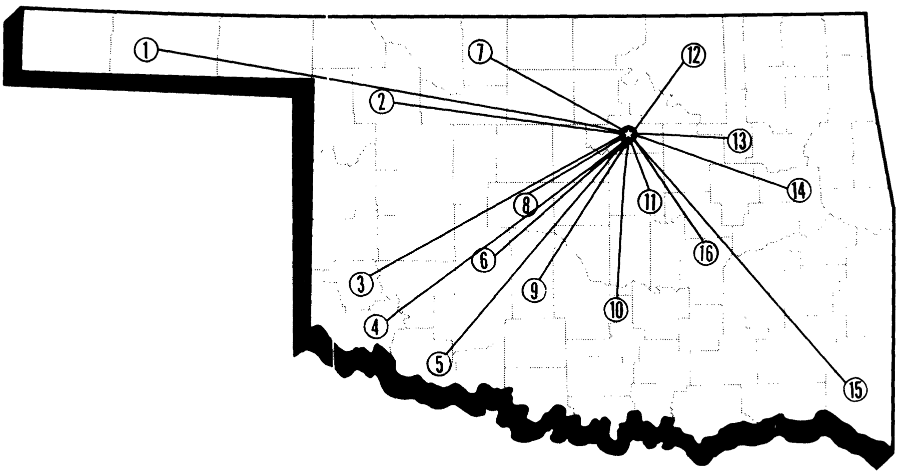
For each of the long hedging simulations, the technical strategies proved superior to the no-hedge and the hedge-and-hold strategies in terms of both a lower average cost of feeders *and* a reduction in risk. This is a result not normally expected and is of some significance if similar results can be witnessed in the future.

Hedgers should recognize that net returns from each production period will not always be increased by selective hedging, but that over time the average net return should be higher and, in some instances, less variable.

OKLAHOMA

Agricultural Experiment Station

System Covers the State



Main Station — *Stillwater, Perkins and Lake Carl Blackwell*

1. **Panhandle Research Station — *Goodwell***
2. **Southern Great Plains Field Station — *Woodward***
3. **Sandyland Research Station — *Mangum***
4. **Irrigation Research Station — *Altus***
5. **Southwest Agronomy Research Station — *Tipton***
6. **Caddo Research Station — *Ft. Cobb***
7. **North Central Research Station — *Lahoma***
8. **Southwestern Livestock and Forage Research Station — *El Reno***
9. **South Central Research Station — *Chickasha***
10. **Agronomy Research Station — *Stratford***
11. **Pecan Research Station — *Sparks***
12. **Veterinary Research Station — *Pawhuska***
13. **Vegetable Research Station — *Bixby***
14. **Eastern Research Station — *Haskell***
15. **Kiamichi Field Station — *Idabel***
16. **Sarkeys Research and Demonstration Project — *Lamar***