How Profitable is Backgrounding Cattle?

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Many beef producers question the profitability of backgrounding cattle before selling them. Many variables potentially impact the profitability of a backgrounding program. The purpose of this study was to evaluate alternative backgrounding programs. Questions we address include:

- Is it more profitable to background heifer or steers?
- What length of time on feed (60, 90, 120, or 150 days) yields the highest returns?
- Does the placement month affect profitability?

This study used the Iowa State University Estimated Returns (http://www.econ.iastate.edu/faculty/lawrence/EstRet/Index.html) to determine corn, hay, modified distiller grains (MDGS), and supplement costs, plus the interest rates from 1995-2008. The supplement is salt and mineral mixture used in a ration that includes modified distiller grains with solubles as the source of protein. Actual MDGS prices were used between 2001 and 2008. From 1995 through 2000, the price was estimated using the simple average of the corn price per pound to MDGS price per pound ratio for all twenty-four months in 2001 and 2002. Then the actual corn price for each the feeding months was divided by this average ratio and adjusted to MDGS price per ton for 1995-2000. The Livestock Enterprise Budgets for IA- 2009 (http://www.extension.iastate.edu/Publications/FM1815.pdf) was also used for other purchased inputs; such as veterinarian/medical, trucking, marketing, and miscellaneous costs. The assumption was made that yardage would be based at 30 cents per day.

Performance estimates and feed rations are based on the starting weight, diet compensation, and the number of days on feed, as analyzed by Iowa State University's BRaNDS Software. Livestock Marketing Information Center compiled USDA reported prices for calves and yearlings over the 14 year period for the St. Joseph, Missouri market. Production variables such as gain, feed efficiency, and death loss are held constant (Tables 1 and 2). Thus, any change in profitability is due to price risk.

Table 1. Inputs for 450# Placed Steers and Heifers

	Steers 60 days	Heifers 60 days	Steers 90 days	Heifers 90 days	Steers 120 days	Heifers 120 days	Steers 150 days	Heifers 150 days
End Weight	572	572	640	633	702	685	759	733
ADG	2.46	2.46	2.11	2.03	2.10	1.96	2.06	1.89
Feed Use								
Corn- bu	7.40	7.40	11.30	11.20	15.42	15.30	19.40	19.22
Hay- ton	0.225	0.225	0.340	0.340	0.470	0.460	0.586	0.575
MDGS- ton	0.150	0.150	0.226	0.226	0.311	0.309	0.390	0.387
Supp.- lb	8.00	8.00	11.60	11.60	15.55	15.45	19.25	19.10
Other $/hd	33	33	42	42	51	51	60	60

Table 2. Inputs for 550# Placed Steers and Heifers

	Steers 60 days	Heifers 60 days	Steers 90 days	Heifers 90 days	Steers 120 days	Heifers 120 days	Steers 150 days
End Weight	695	675	765	735	832	793	892
ADG	2.42	2.08	2.39	2.06	2.35	2.03	2.28
Feed Use							
Corn- bu	7.82	7.72	12.38	12.17	17.26	16.89	21.88
Hay- ton	0.235	0.232	0.372	0.366	0.519	0.509	0.658
MDGS- ton	0.157	0.155	0.248	0.244	0.346	0.338	0.438
Supp.- lb	7.35	7.25	11.60	11.40	16.20	15.85	20.55
Other $/hd	33	33	42	42	50	51	60

Note: Other costs include yardage, veterinarian and medical, trucking and marketing (excluding 2% commission), and miscellaneous.

This study compared steers to heifers for a 14 year period (1995-2008) with placement months of September, October, November, and December. Sales months were November, December, January, February, and March, depending on the length of time the cattle ownership was retained. Table 3 indicates the time on feed with the placement months as the rows and the sale months as the columns.

Table 3. Days Backgrounded by Placement and Sales Months

	Sale Months				
Placement Months	November	December	January	February	March
September	60 Days	90 Days	120 Days	150 Days	
October		60 Days	90 Days	120 Days	150 Days
November			60 Days	90 Days	120 Days
December				60 Days	90 Days

Results

Figure 1, Distribution of Net Returns, Steers 1995-2008, shows that net returns across all weights and placements months fell between -$75 and $25 approximately 77% and 79% of the time for 450# and 550# placements, respectively. Net returns for steers were negative 58% and 63% of the time for the 450# and 550# placements. Overall, backgrounding 450# steers yielded positives returns more often than 550# steers and had the highest percentages in the upper profit margins. Figure 2, Distribution of Net Returns, Heifers 1995-2008, shows that net returns were negative about 52% and 55% of the time when placing 450# and 550# heifers, respectively. Twenty-eight percent of returns for 450# placements were above $25 per head, and twenty-one percent of returns for 550# placements above $25 per head. Therefore, placing 450# heifers in the fourteen year period between 1995 and 2008 provided more positive returns and more occasions of the larger returns than placing 550# heifers. Comparing Figure 1 to Figure 2 shows that over the last 14 years, backgrounding 450# heifers has earned the highest amount of positive returns, especially returns above $25 per head. However in general, backgrounding either 450# steers or heifers of either placement weight only varied by a few percentage points. Backgrounding 550# steers was the least viable. Yet, over the last 14 years, none of the techniques were profitable more than fifty percent of the time, but all, except placing 550# steers, were profitable at least forty percent of the time, given the assumptions and the historical prices.

Figure 3 and Figure 4 show the net returns ($/head) and sale prices ($/cwt) for a specific situation. In order to compare net returns from year to year, the figures look at steer calves placed in October and fed for 90 days, to then be sold in January. This study is conducted such that returns and selling prices can be compared over the years. It could be done with any of the specific situations, like 450# heifers placed in September and fed for 120 days, and the analysis would be very similar. Figure 3 is for steer calves placed at 450#, and Figure 4 is for 550# steer placements.

Overall, 450# and 550# placements acted in a similar manner. Therefore, the analysis will include descriptions that apply to both placement weights. First of all, no cyclical, or repeating, patterns were discerned over the 14 year period with the net returns. Rather, the net returns fluctuate year to year, without any real predictable pattern. Historically, the best indicator of net return changes has been the selling price. When the selling price made a fairly large jump from the previous year, the net returns peaked and were positive. However, the next year when the selling price increased or decreased by a relatively small amount from the previous year, the net returns had a dramatic decrease, and often were negative. Consequently, this illustrates some market implications. When the sale price made a fairly drastic jump from the previous year, the costs of production did not yet adjust, and were still reasonably low. As a result of the increased price and the fairly low costs, the net return peaked. However, through the next year, the production costs adjusted to the higher sale prices by increasing; thus, significantly decreasing the net returns, even if the sale price was similar. Using Figure 3, these shifts will be examined. For example, from 1998 to 1999, the sale price increased from $73.41/cwt to $90.45/cwt, and the net return then peaked in 1999 at $63.11/head, increasing from the 1998 mark of $22.80/head. However, as the production costs adjusted, the net return decreased to $0.53/head in 2000, even though the sale price had increased by over $2/cwt. There were three of these occasions in which it peaked in the 14 year period: 1996, 1999, and 2005.

Additionally, the study of Figures 3 and 4 indicate some other important factors. While there were some fluctuations in the sale price of the backgrounded calves, generally from 1995 to 2005 the sale price was trending upward. The sale price for 450# steer placements increased from $58.52/cwt in 1995 to $123.81/cwt in 2005. During this time frame, the net returns for backgrounding calves fluctuated based on the previous discussion. However, in recent history, 2005-2008, there has been a market shift. For example, the sale price for the 450# placements decreased from $123.81/cwt in 2005 to $102.90/cwt in 2008. Along with this lower price level, feed costs increased greatly at this same time, such that net returns for backgrounding were impacted tremendously. From the 2005 to the 2006 calf crop, the net returns for the 450# placements decreased from $17.39/head to -$81.05/head. 2006-2008, the sale prices stayed around the same levels and the net returns remained negative. Yet, in 2008, the net returns began moving in the right direction. The feed expenses had decreased significantly from 2007, such that the loss was $8.49/head, rather than in the -$80/head range, like 2006 and 2007. For backgrounding to become profitable again, the production costs will have to continue to decrease and/or the sale prices will have to increase.

Figures 5-12 indicate the buy/sell margins for the placement months, at each of the specific feeding periods for both steers and heifers. The buy/sell margin is the difference between the price paid per hundredweight and the price received per hundredweight for selling the calves (purchase price – sale price). It is an important tool when backgrounding calves because if it is positive, indicating the purchase price is greater than the sale price, this amount will have to be earned by reducing the cost of gain before having a profitable operation.

Figures 5-8 are for each of the placement months for 450# calves, and Figure 9-12 are for each of the placement months for 550# calves. Each vertical line on the graphs indicate the range (over 1995-2008), the maximum and the minimum points of the buy/sell margins, for a specified feeding period for either steers or heifers. For example, the first vertical line on Figure 5, labeled "60 S," represents the range of buy/sell margins for steers placed in September and fed for 60 days. The "H" labels denote the results for heifers. The square on each of the ranges indicate the average of the buy/sell margins over the fourteen years of data. For instance, using Figure 5, on average, the buy price was just over $15/cwt over the selling price for steers fed for 60 days.

Four unique characteristics emerged from the buy/sell margin study. The first concept is steer calves had a higher buy/sell margin than heifer calves when fed for the same length of time and placed in the same month. The range of the margins for heifers was most often lower than the range for steers. This observation was true with calves placed at 550# and calves placed at 450# in November and December. To illustrate, look at calves placed in September at 550# (Figure 9). Steer calves fed for 60 days had an average buy/sell margin of $14.15/cwt and a range of $36.73/cwt, while heifers fed for the same period of time, averaged a margin of $7.94/cwt and had a range of $29.60/cwt. This concept was very common throughout the results.

Second, within each placement month, a trend was consistently noticed, especially with steer calves of both 450# and 550# placements. As the length of time on feed increased for steers, the average buy/sell margin increased. As a consequence, the steers that were backgrounded for a longer period of time required a greater reduction in the cost of gain to be profitable than those backgrounded for a shorter period of time. Also, as the feeding period increased, so did the difference between the maximum and the minimum, which indicates variability in the margins. As a result, steers fed longer usually had greater variability in the buy/sell margin and were more risky. These aspects can be observed in nearly every placement month. For instance, by observing Figure 6, steers placed in October at 450# and fed for 60 days averaged a buy/sell margin of $10.68/cwt. Going from 60 to 90, to 120, to 150 days on feed, the margin increased from this to $15.09/cwt, $18.09/cwt, and $18.79/cwt respectively. The risk also rose. The range increased from $25.65/cwt for 60 days on feed, to $34.28/cwt, to $40.72/cwt, and to $41.17/cwt for each of the respective increments. Generally, the same situation arose in heifer placements as well, but as days on feed increased, the average buy/sell margin did not always rise. However, the degree of increase was not nearly as high as that of steer placements.

The third observation was associated with the buy/sell margins as going across the placement months. Keeping the placement weight, the time being backgrounded, and the sex the same, as the calves were placed later in the year, the average buy/sell margin always decreased. However, going across the results in this manner, the range exhibited no consistent patterns. By examining the differences in the margin for 550# steers fed for 90 days, this trend can be distinguished (Figures 9-12). Placed in September, the steers averaged a buy/sell margin of $13.62/cwt. Going from September to October, then to November, and then to December, the margin decreased to $12.03/cwt, to $10.75/cwt, to $9.50/cwt, respectively. Similar comparisons can be made with any feeding period and with both steers and heifers.

Lastly, going from 450# to 550# placements, for either steer or heifers of the same feeding period and placement month, the average buy/sell margin typically decreased. Additionally, the range of margins was lower with the 550# placements. This can be observed by looking at Figure 5 and Figure 9. For heifers fed for 60 days, when placed at 450#, the average margin was $12.17/cwt and the range was $38.86/cwt. For 550# placements, the average was $7.94/cwt and the range was $29.60/cwt. There are just a few instances were this did not hold true, but those can be distinguished by using the figures to make comparisons.

Summary

Compared to the study performed in 2006 for analyzing the benefits of backgrounding calves, several changes were made. A more rapid rate of gain was assumed in this 2009 analysis. Reflecting a more aggressive management strategy, compared to what was used in 2006, which is used more often in backgrounding operations. Also, the 2009 study utilizes modified distillers grains in the ration, which was not used in the 2006 analysis. It was changed to better reflect the type of ration now used in most situations. These alterations slightly shifted the results, such that both steers and heifers were profitable more of the time than discovered in the 2006 study.

Analyzing the past 14 years of data gives us some understanding of what the future may hold. This study shows us that purchasing calves to background, whether steers or heifers, has not been a profitable, on average, the past 14 years (1995-2008) given the performance and costs used. However, since three of the four strategies were profitable at least forty percent of the time, backgrounding cattle can earn positive returns in some situations.

Determining when backgrounding may be worthwhile, in part, can be related to the historical buy/sell margin. By realizing under what conditions; like the sex of the calf, the placement month, the placement weight, and the length of time being backgrounded; the buy/sell margin was fairly low in the past, producers can make the situation more favorable toward profitability. With noting trends like those determined in this fourteen year study, certain conditions can possibly be met that have favored a lower buy/sell margin in the past. That is, if the current market situations resemble historical ones. While earning a profit also depends on variations in cost, a lower margin gives producers a boost. By being aware of what has happened in recent history, producers can position their operations in a manner that are more supportive of earning returns to in backgrounding.

Figure 1

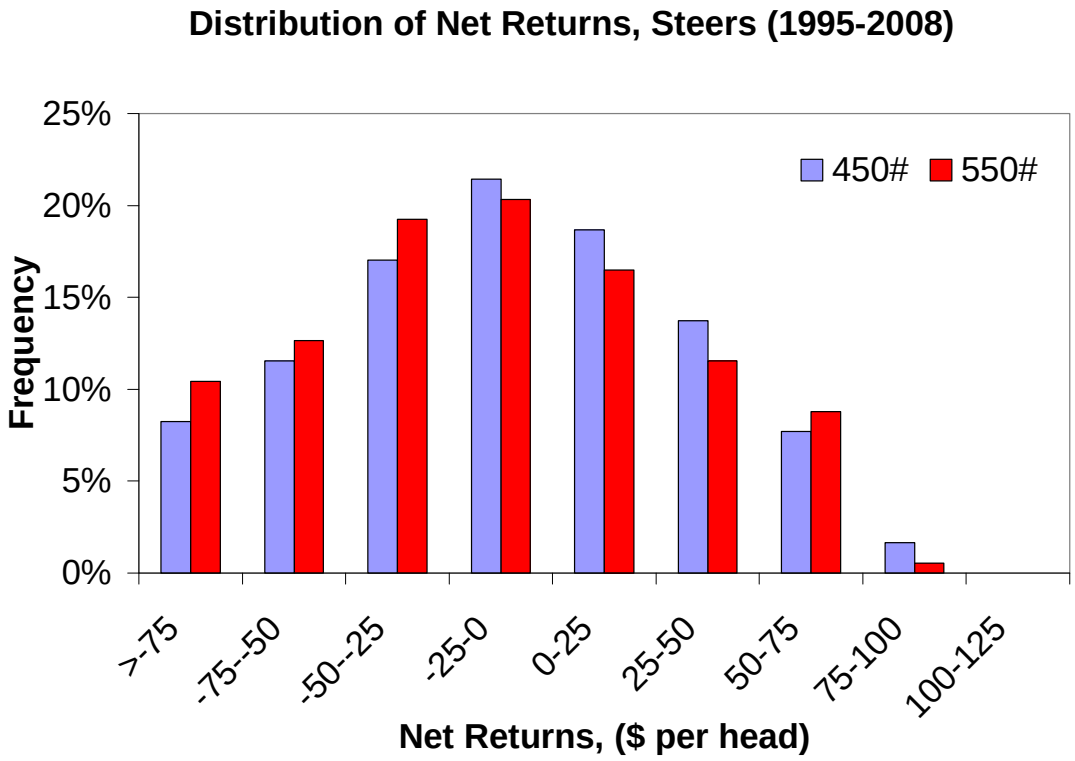


Figure 2

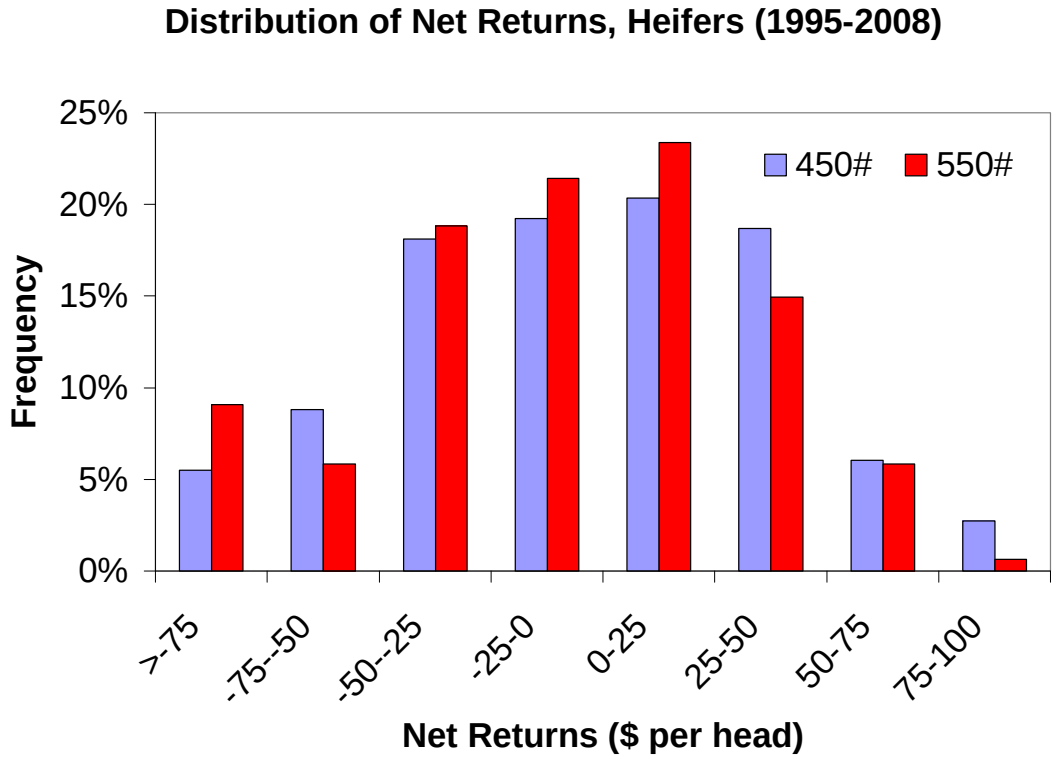


Figure 3

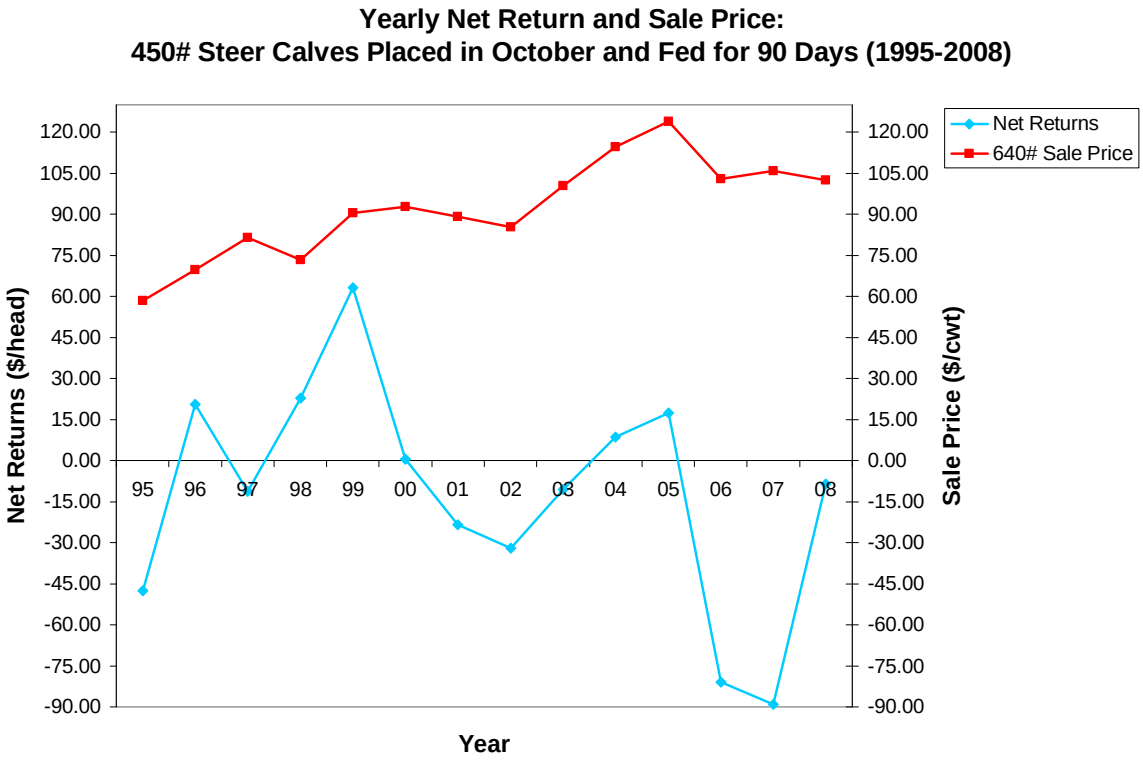


Figure 4

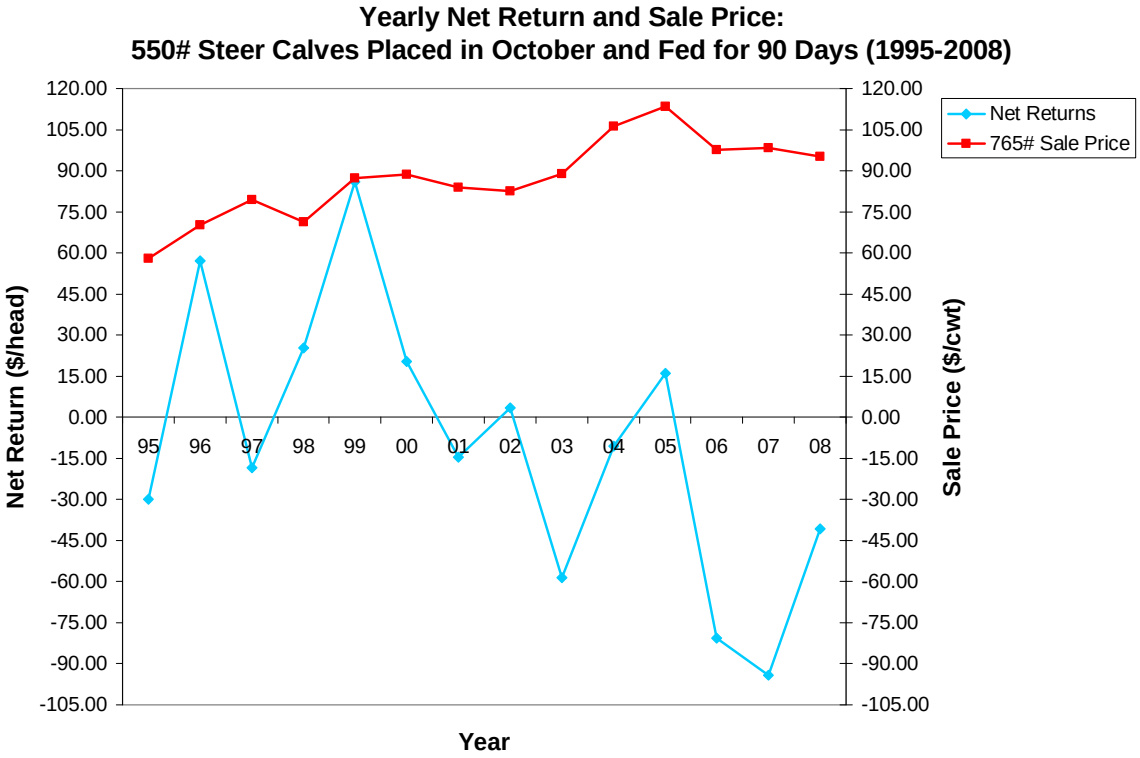


Figure 5

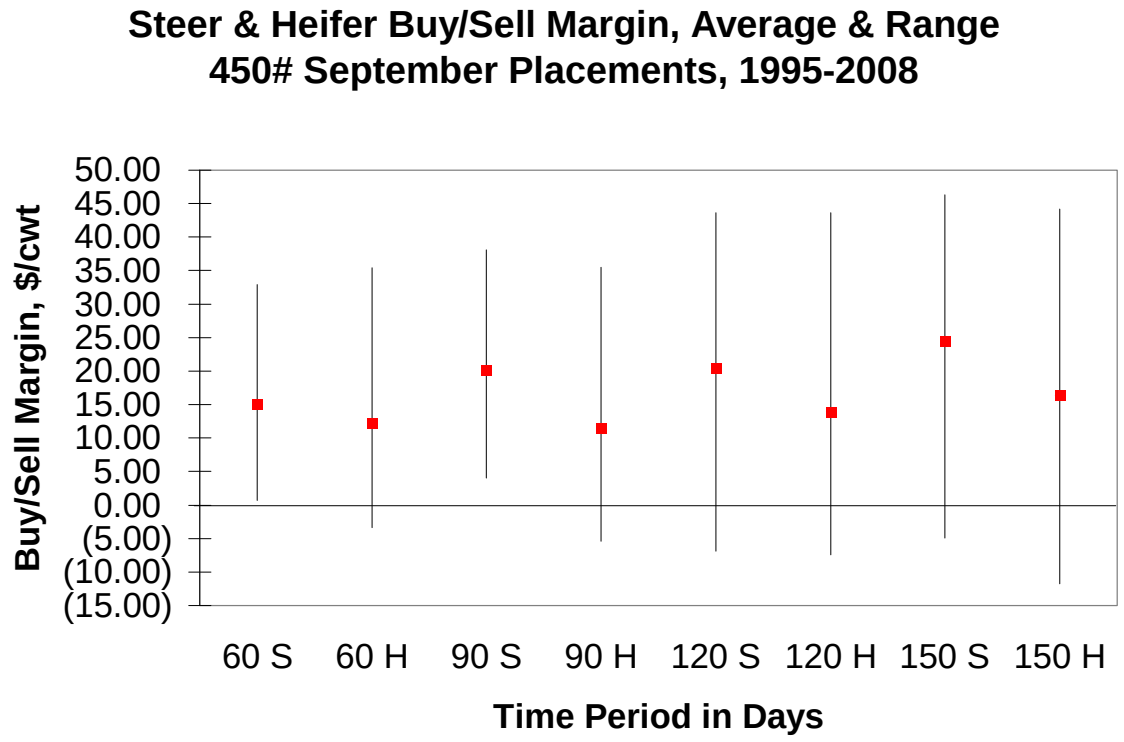


Figure 6

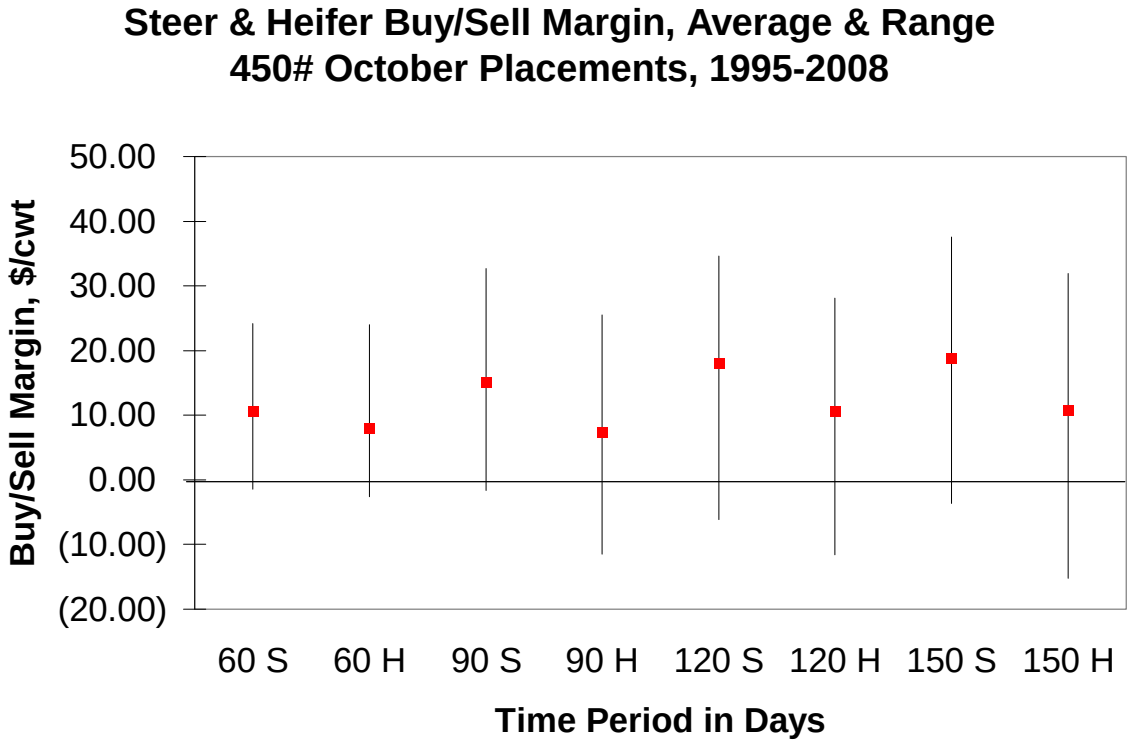


Figure 7

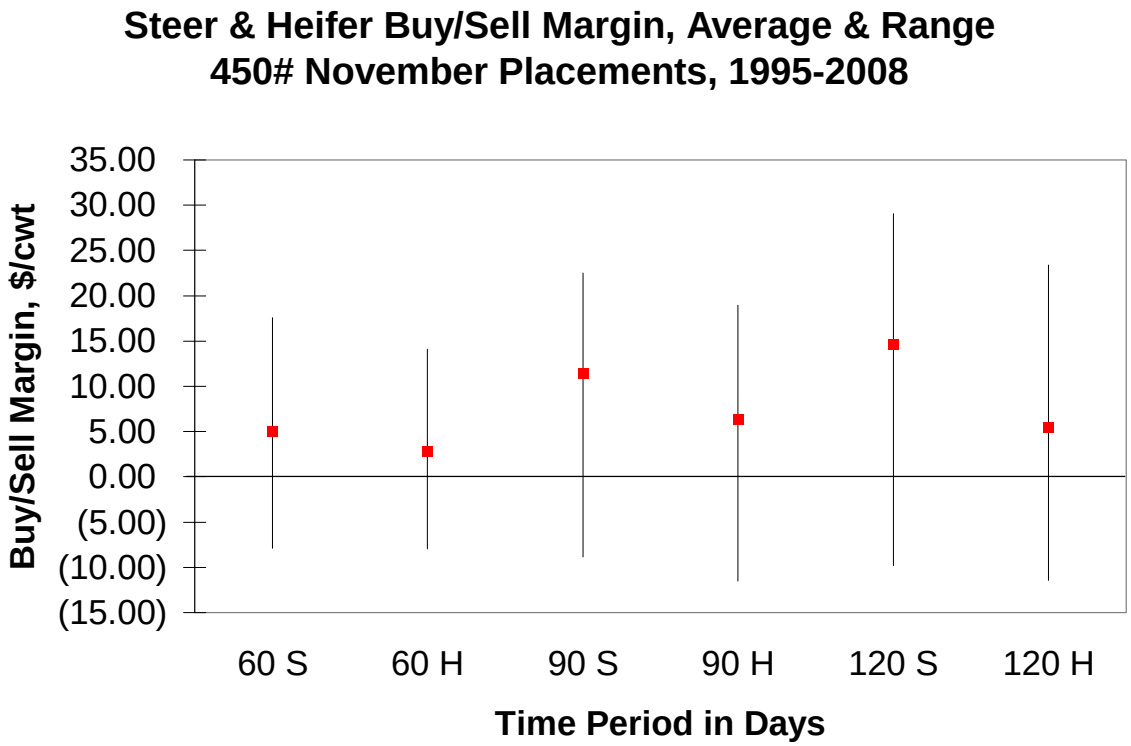


Figure 8

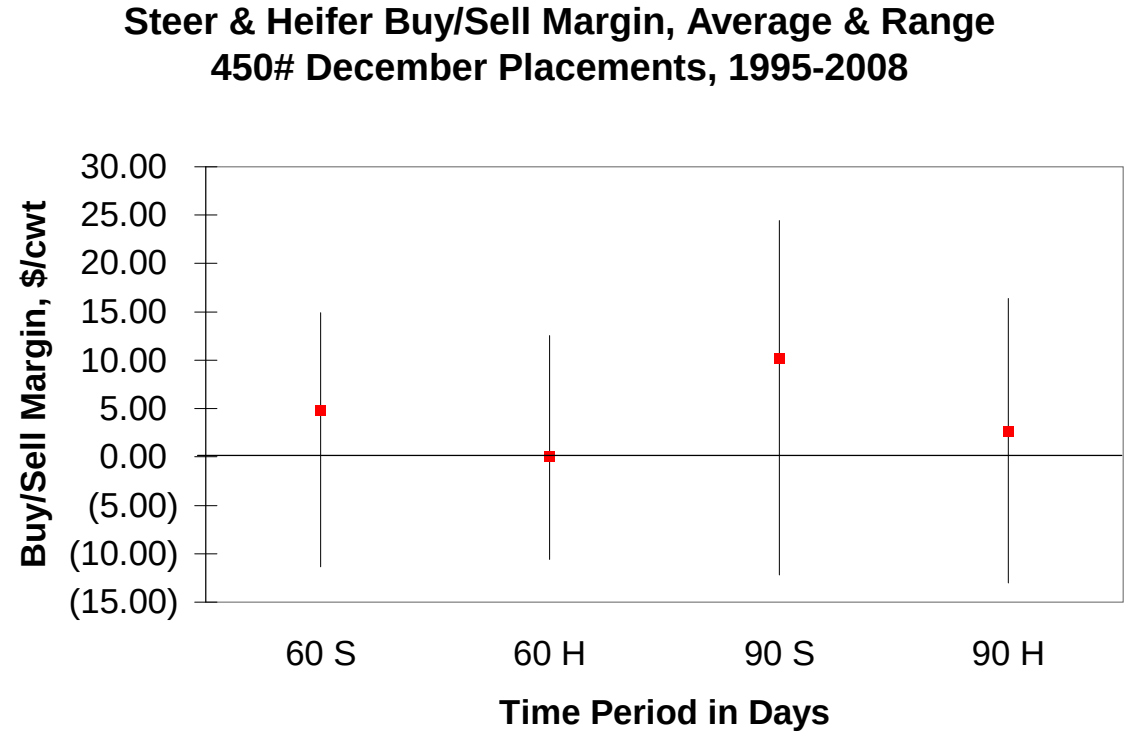


Figure 9

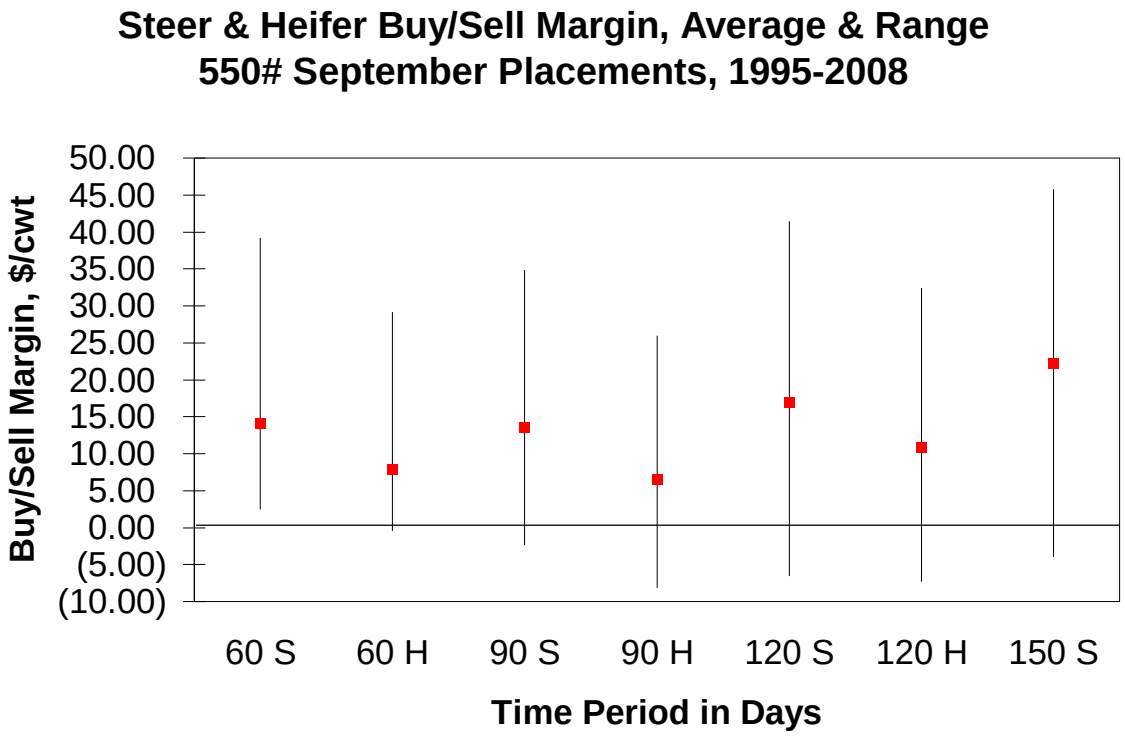


Figure 10

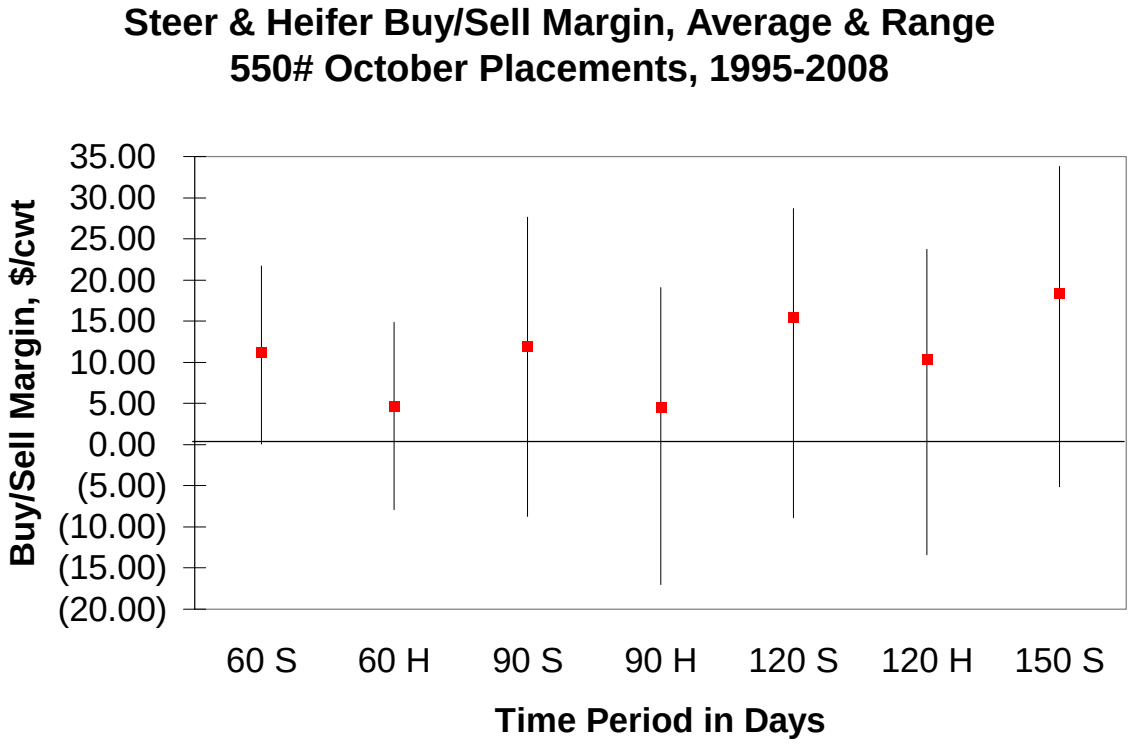


Figure 11

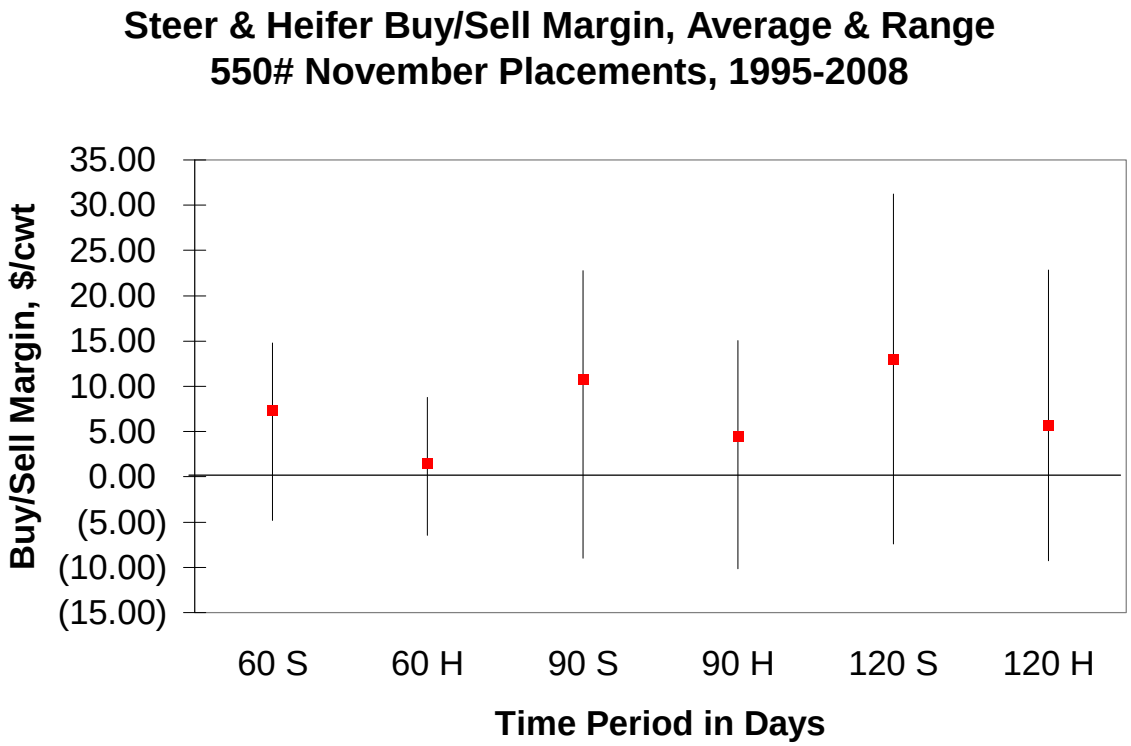
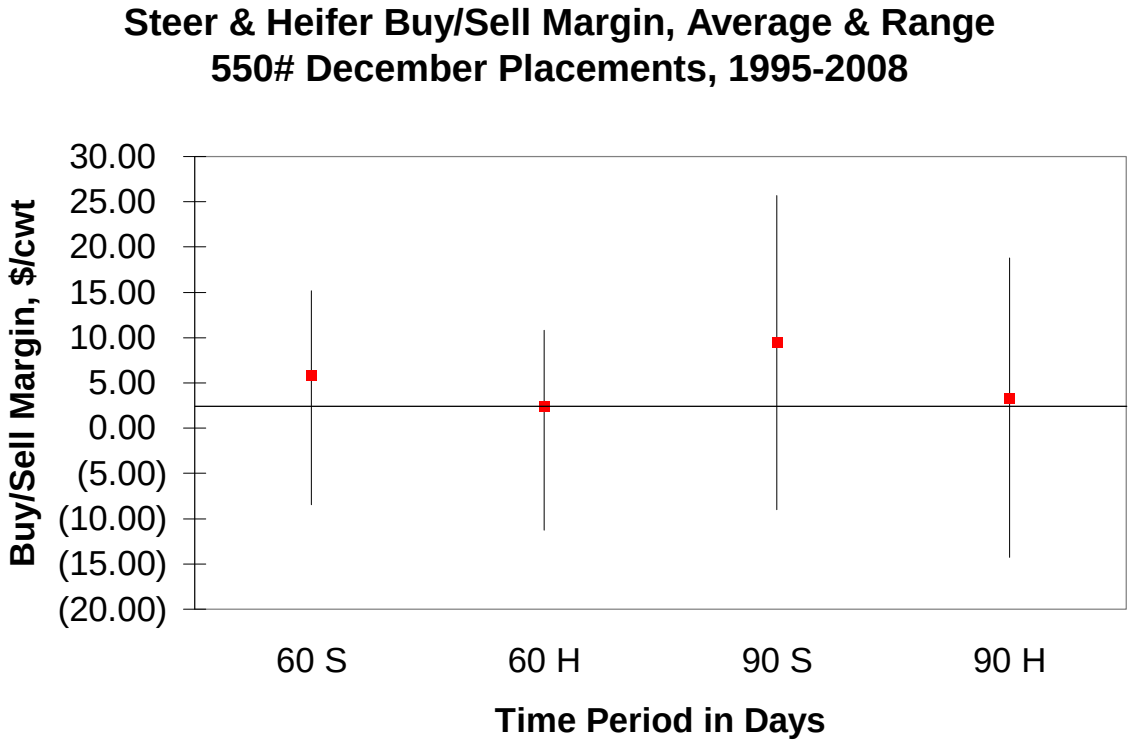


Figure 12



Note: Figures 3-10 ignore all production costs; they include only purchase and selling prices.