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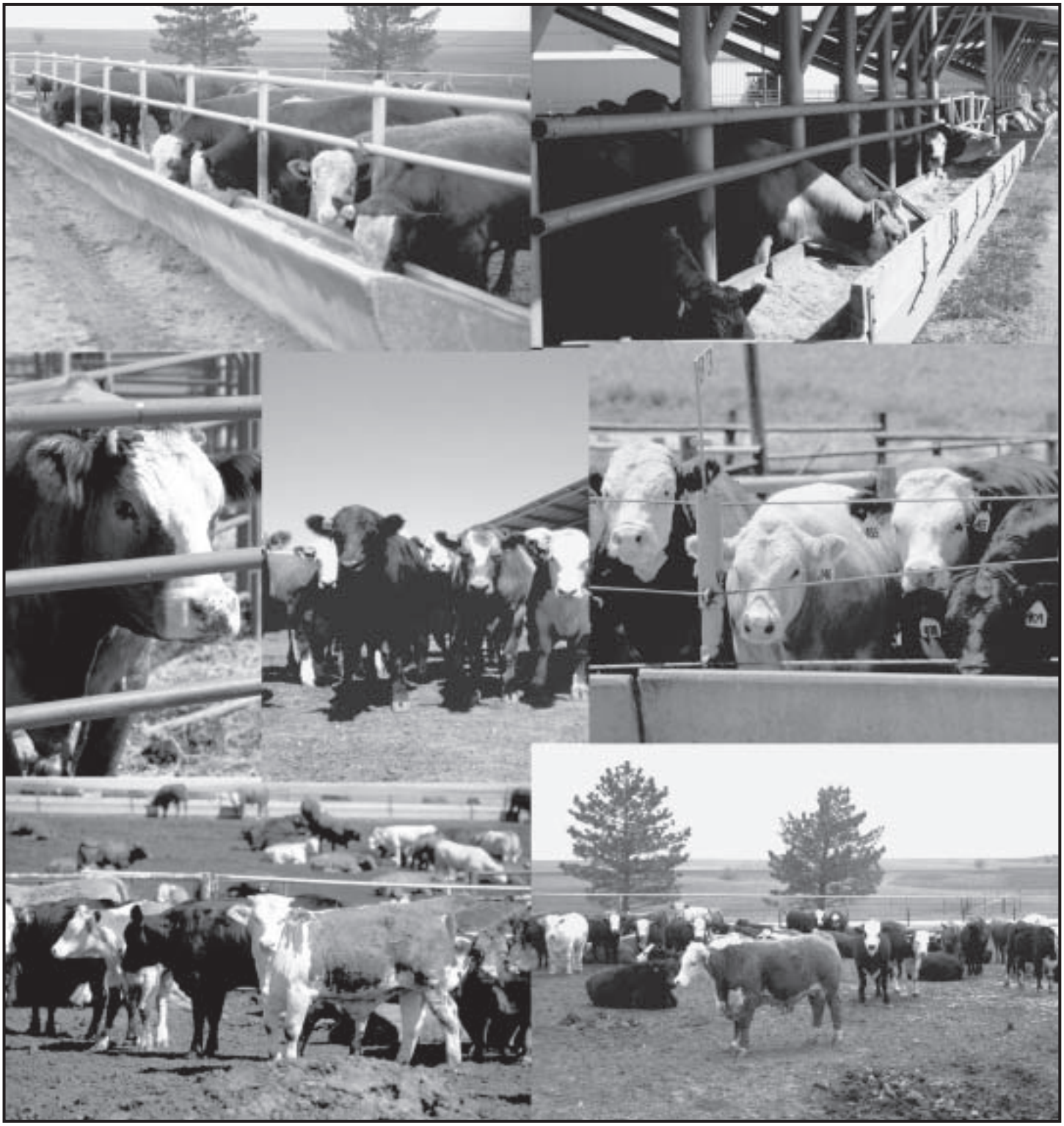

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

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Seasonal Trends in Steer Feeding Profits, Prices, and Performance

Darrell R. Mark
Agricultural Economist
Department of Agricultural Economics
University of Nebraska - Lincoln

Rodney Jones
Agricultural Economist
Livestock Production

James Mintert
Agricultural Economist
Livestock Marketing

Numerous factors affect the profitability of feeding cattle, including fed and feeder cattle prices, corn prices, interest rates, feed conversion, and average daily gains. To make use of effective risk management strategies, cattle feeders should understand how changes in these factors affect profitability. This publication explains seasonal trends in steer feeding profits, cattle prices, corn prices, feeding cost of gain, and cattle feeding performance in Kansas. Results indicate:

- Steers placed on feed in late spring to early summer are generally more profitable than steers placed on feed in late winter and early spring at the same weight. Also, profit variability was higher for steers placed on feed during the fall, winter, and spring.
- Fed cattle prices typically reach their seasonal peak in late winter to early spring, with the lowest prices occurring during the summer. Prices for heavy weight feeder steers typically peak in early winter and decline rapidly by mid-spring. Conversely, prices for lighter weight steers are typically at their peak in late winter and early spring. Corn prices in Kansas are generally lowest during harvest (September and October) and then increase seasonally until June.
- Typically, feeding cost of gain is highest for steers placed on feed during the fall and lowest for spring placements. Feeding cost of gain is highest for heavy weight steers when placed on feed from November through April. For light weight steers, highest feeding cost of gain occurs for May through October steer placements.
- Steers placed on feed during the spring tend to have the best feed conversions and highest average daily gains, whereas fall placements have poorer feed conversions and average daily gains. Light weight steers have better feeding performance than heavy weight steers when placed on feed from May through October.

Introduction

Net returns to cattle feeding in Kansas are variable and expose cattle feeders to significant levels of economic risk. Much of this risk is generated by changes in fed and feeder cattle prices, corn prices, interest rates, and cattle performance (Mark, Schroeder, and Jones). Managing economic risks associated with cattle feeding requires that cattle feeders anticipate how these factors change over long time periods, and how they vary seasonally within a year. This publication examines seasonal variation in steer feeding profitability, average daily gains, feed conversions, cattle prices, corn prices, and feeding cost of gain.

Seasonal trends in fed cattle, feeder cattle, and corn prices were examined using western Kansas price quotes from USDA's Agricultural Marketing Service (AMS) and Kansas Agricultural Statistics from 1985 to 1999. Seasonal differences in cattle and corn prices, along with seasonal trends in steer feeding performance (average daily gain and feed conversion), generate seasonal variation in feeding cost of gain and, ultimately, feeding profitability. To analyze seasonal trends in steer feeding performance, profits, and cost of gain, feedlot performance data from more than 9,500 feedlot pens of steers placed on feed between January 1985 and August 1999 were collected from two western Kansas commercial feedyards. Placement date, placement weight, feeder purchase price, days on feed, feed conversion (as-fed basis), average daily gain, feeding cost per pound of gain, sale weight, and sale date were collected from individual feedlot closeouts.

The closeout data analyzed in this report are for steers placed on feed at weights ranging from 600 to 899 pounds. Results are reported for three placement weight categories (600 to 699, 700 to 799, and 800 to 899 pounds). Limited performance information is also provided for 500- to 599-pound steer placements.

Feedlot closeout data were used to calculate profits per head for each pen of cattle. Gross revenue from the sale of the

Table 1. *Average and Standard Deviations of Selected Steer Feeding Factors, January 1985 to August 1999*

	Placement Weight							
	500 to 599		600 to 699		700 to 799		800 to 899	
Variable	**Average**	**Std. Dev.**	**Average**	**Std. Dev.**	**Average**	**Std. Dev.**	**Average**	**Std. Dev.**
Net Profit ($/head)	8.41	66.12	11.44	66.99	13.05	63.32	10.39	63.22
Fed Price ($/cwt)	71.44	6.98	69.55	7.43	68.92	6.98	68.05	6.48
Feeder Price ($/cwt)	83.76	11.59	77.35	10.89	74.63	10.22	71.75	9.69
Placement Weight (lbs.)	566	25	661	27	751	27	839	27
Days on Feed	188	25	155	20	132	17	120	15
Sale Weight (lbs.)	1,111	71	1,143	66	1,185	64	1,246	63
Feed Conversion (lbs. feed/lb. gain)[a]	8.28	0.94	8.22	0.93	8.25	0.89	8.52	0.95
Average Daily Gain (lbs./day)	2.82	0.42	3.08	0.41	3.27	0.38	3.37	0.40
Cost of Gain ($/cwt)	49.92	7.03	49.90	7.84	49.61	7.73	51.74	8.40
Corn Price ($/bu.)	2.42	0.43	2.48	0.54	2.45	0.54	2.47	0.56
Hay Price ($/ton)	79.96	15.27	79.40	18.47	76.49	18.93	78.41	18.85
Number of Pens	261		1,794		4,613		3,087	

[a] *As-fed basis.*
Source: Kansas State University

finished steer, minus the cost of the feeder steer and total cost of gain, equals profit per head. Total cost of gain includes feed costs, veterinary costs, processing, and yardage fees, plus interest charges on both the feeder steer's purchase price and one-half of the feeding costs. The steer closeouts did not include interest rates and, in some cases, fed and feeder cattle prices. Therefore, interest charges were calculated using the monthly interest rate for feeder cattle loans reported by the Kansas City Federal Reserve Bank. When the feeder steer price was missing for a pen of cattle, a price was computed from the Dodge City, Kansas, feeder cattle auction market summary (AMS-USDA) for the placement week, using a linear price slide across weights. Weekly average western Kansas direct fed steer prices (live weight basis) (AMS-USDA) were substituted when finished steer sale prices were unavailable.

Summary statistics for selected prices, costs, and performance factors are reported in Table 1 by placement weight category. These summary statistics illustrate differences across four placement weight categories. The average number of days on feed decreased from 188 for 500- to 599-pound placements to 120 for 800- to 899-pound placements. Feed conversion increased as placement weight rose above 600 pounds, ranging from 8.22 to 8.52 pounds of feed per pound of gain (as-fed). Higher feed conversions for heavy weight cattle are typical because feed efficiency declines as the animal reaches its finished weight. Average daily gain for 500- to 599-pound placements was 2.82 pounds per day and increased to 3.37 as placement weight increased to 800 to 899 pounds. Correspondingly, average sale weight increased from 1,111 pounds for 500- to 599-pound placements to 1,246 pounds for 800- to 899-pound placements. Thus, steers placed on feed at heavier weights tended to gain weight more rapidly and were slaughtered at heavier weights. The decrease in feeder cattle prices as placement weight increases reflects the typical price slide observed for various weight feeder steers. Feeding cost of gain, which includes all costs except interest on the feeder steer and feed expenses, ranged from $49.61 per hundredweight to $51.74 per hundredweight.

Steer Feeding Profitability

Average net profit per head from 1985 to 1999 ranged from $8.41 per head for 500- to 599-pound placements to $13.05 per head for 700- to 799-pound placements (Table 1). Standard deviations of net profit ranged from $63.22 to $66.99 per head, depending on placement weight, which indicates there was considerable variation in feeding profits during these 15 years. Some of this variation can be

observed by examining monthly and yearly average feeding profits from 1985 to 1999.

Monthly average profits for 700- to 799-pound placements ranged from a high of $137.13 per head for steers placed in January 1987 to a low of –$147.22 for steers placed in September 1997 (Figure 1). Figure 2 illustrates that annual average steer feeding profits for 700- to 799-pound placements ranged from $65 per head profit in 1986 to a loss of $68.71 per head in 1997. Furthermore, an examination of Figures 1 and 2 reveals that cattle feeding experiences extended periods of losses and profits.

Net returns to steer feeding are subject to risks from fluctuating feeder and fed steer prices, feed prices, cattle performance, and interest rates. Feeders need to consider these risks as they develop budget projections and consider placing cattle on feed. Higher feeder cattle purchase prices, feed prices, and interest rates, as well as poor cattle performance, all increase costs and, if everything else is held constant, reduce steer feeding profitability. Lower than expected profitability may also result from declines in fed steer prices, all else held constant.

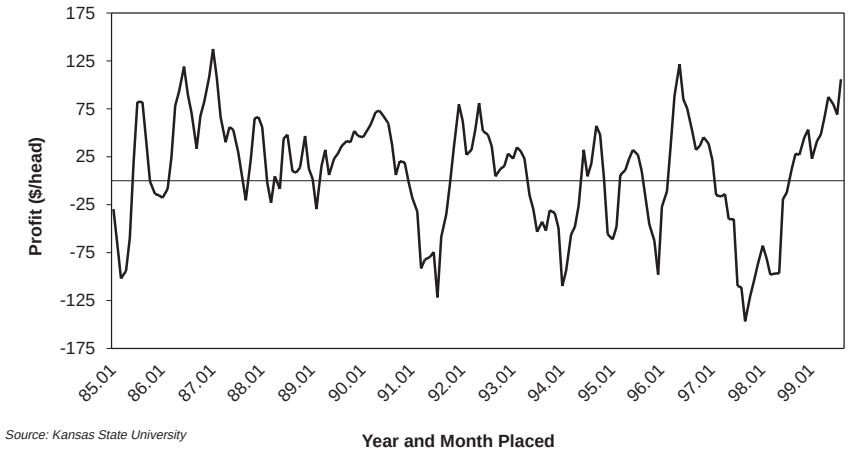
Seasonality of Profitability

Figures 3, 4, and 5 illustrate the seasonal pattern of steer feeding profits (dollars per head) for 600- to 699-, 700- to 799-, and 800- to 899-pound placements, respectively. The standard deviations of steer feeding profits provide a measure of steer feeding profit variability for each month. The standard deviation lines above and below the month's average feeding profit define a range in which profits are likely to fall approximately 68 percent of the time.

Average profit levels were seasonally low for 600- to 699-pound steers placed on feed during February and March (Figure 3). Profits reached a seasonal peak for June placements, dipped somewhat for July placements, and then increased modestly for steers placed on feed through late fall. Profit variability was smallest for 600- to 699-pound steers placed in June, August, and September, but increased substantially for fall and winter placements.

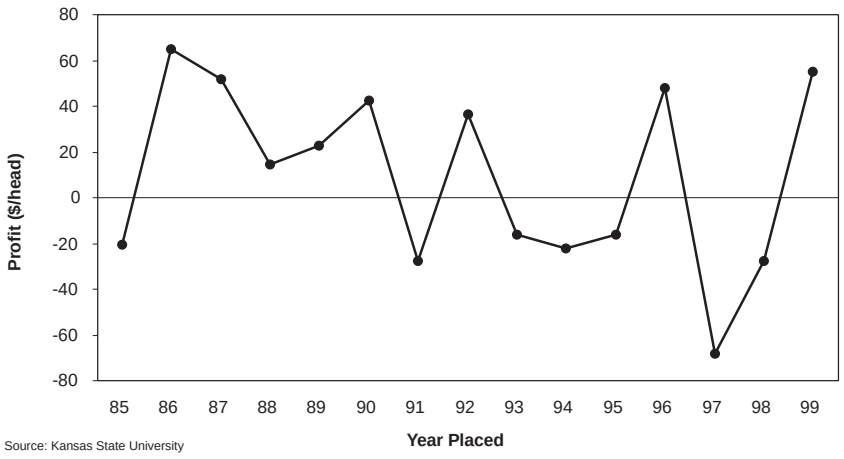
The seasonal profit pattern for 700- to 799-pound steer placements was similar to the pattern for 600- to 699-pound steers (Figure 4). The seasonal low in monthly average

Figure 1. *Monthly Average Steer Feeding Profit For Steers Placed on Feed at 700 to 799 lbs.*



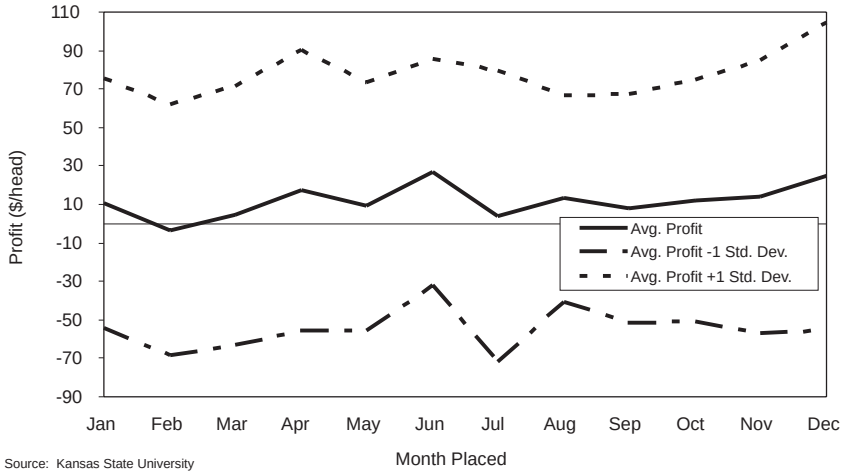
Source: Kansas State University

Figure 2. *Average Annual Steer Feeding Profit For Steers Placed on Feed at 700 to 799 lbs.*



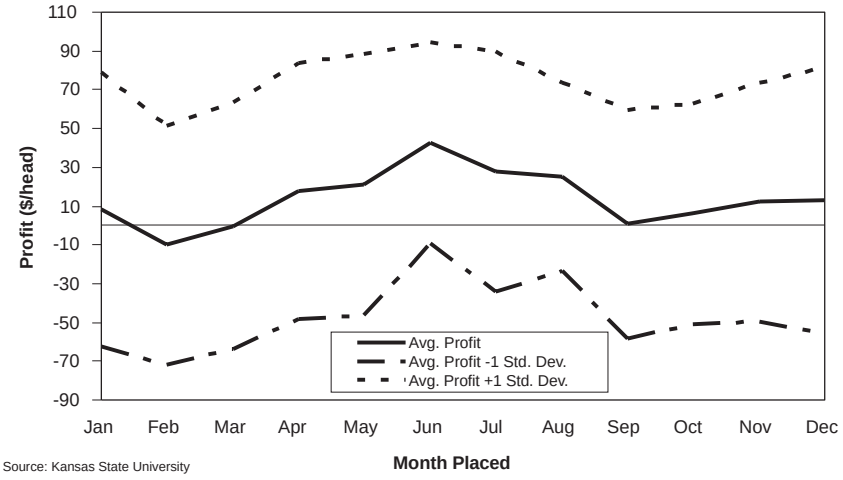
Source: Kansas State University

Figure 3. *Seasonal Steer Feeding Profit and Standard Deviations for 600- to 699-lb. Placements.*



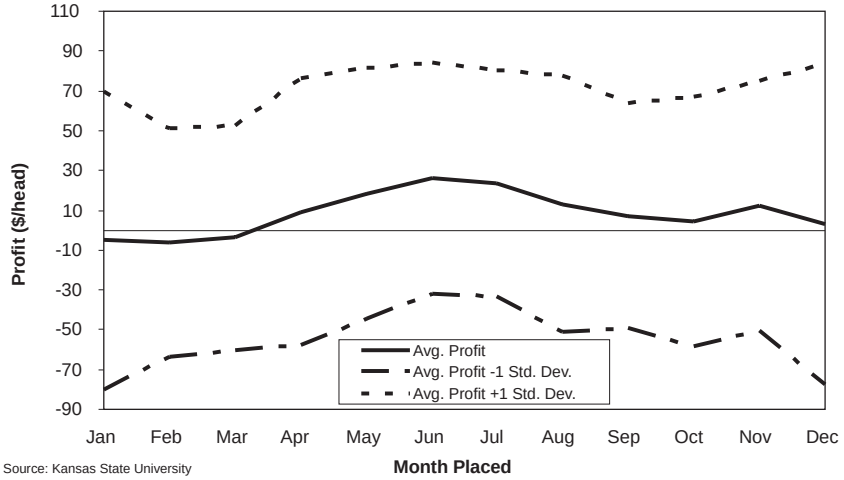
Source: Kansas State University

Figure 4. *Seasonal Steer Feeding Profit and Standard Deviations for 700- to 799-lb. Placements.*



Source: Kansas State University

Figure 5. *Seasonal Steer Feeding Profit and Standard Deviations for 800- to 899-lb. Placements.*



Source: Kansas State University

profits occurred for February placements, and average profits were highest for 700- to 799-pound steers placed during the summer months, peaking at over $42 per head for June placements. Average profit levels fell below June's for July and August placements and then increased seasonally for September through December placements. Profit variation for 700- to 799-pound steers was lowest for summer placements and highest for late fall through early spring placements. Average profits followed a similar seasonal trend for the heavier 800- to 899-pound placements. The least profitable time to place heavy steers on feed in the time period of this study was January through March. Conversely, the most profitable time to place heavy steers on feed was late spring and early summer. Profit variation was largest for fall through early spring placements. Thus, for heavy weight steers, average profits are highest, and profit risk lowest, for cattle placed on feed in late spring and early summer.

The data for Figures 3 through 5 are summarized in Tables 2 through 4, respectively. The information in these tables can be used when formulating budget projections and as an aid in considering when to place various weight steers on feed. For example, when comparing potential placements of 700- to 799-pound steers in April versus September, the data in Table 3 reveal that average daily gains for April placements are, on average, about 10 percent higher than for September placements (3.40 pounds per day for April placements versus 3.09 September placements). In addition, feed conversion and cost of gain are about 10 and 7 percent lower (better), respectively, for April versus September 700- to 799-pound steer placements. This information can be incorporated directly into budgets used to project breakeven prices for cattle placed on feed at various times during the year.

Calf feeding programs (placing 550 pound calves directly in a feedlot) are sometimes popular in Kansas. These programs are especially attractive when feedgrains are inexpensive relative to forages, or when forages are in short supply. The most popular calf feeding placement months are October and November, when calves are typically weaned. Performance and profitability averages for 500- to 599-pound October and November steer placements are reported in Table 2. Due to the small number of 500- to 599-pound steers placed on feed in other months, average performance and profitability data are not reported for other placement months.

Seasonality of Corn and Cattle Prices

Economic factors affecting steer feeding profitability also have seasonal trends that contribute to profit variability. Figures 6 through 11 depict seasonal indices for Kansas corn prices, western Kansas fed steer prices, and Dodge City feeder steer prices, respectively, from January 1985 to December 1999. The price indices reveal how prices vary within a year (not across multiple years) around the annual average price for that year. Specifically,

Table 2. *Average Monthly Values of Steer Feeding Factors for 500- to 599-lb. and 600- to 699-lb. Placements (January 1985 to August 1999)*

Placement Month	Number of Pens (number)	Cost of Gain ($/cwt)	Feed Conversion (lbs. feed/lbs. gain)[a]	Average Daily Gain (lbs./day)	Profit ($/head)	Std. Dev. Of Profit ($/head)
			600 to 699 lb. Placements			
January	206	47.38	7.78	3.22	10.71	64.90
February	137	47.41	7.70	3.35	-3.31	65.31
March	150	46.68	7.69	3.40	4.41	67.28
April	91	49.08	7.80	3.43	17.45	72.68
May	113	49.07	7.97	3.21	9.15	64.60
June	63	48.76	7.85	3.28	27.08	58.65
July	98	50.56	8.24	3.13	4.00	75.52
August	148	50.95	8.42	3.04	13.12	53.62
September	161	52.03	8.72	2.87	7.95	59.75
October	243	53.29	8.88	2.78	12.07	62.85
November	208	51.82	8.48	2.89	13.86	71.07
December	176	48.79	8.22	2.99	24.70	80.21
			500- to 599-lb. Placements[b]			
October	49	52.33	8.80	2.57	16.64	59.22
November	46	49.55	8.11	2.77	15.57	69.53

[a] *As-fed basis.*
[b] *Data limitations prevent reporting of other months.*
Source: Kansas State University

Table 3. *Average Monthly Values of Steer Feeding Factors for 700- to 799-lb. Placements (January 1985 to August 1999)*

Placement Month	Number of Pens (number)	Cost of Gain ($/cwt)	Feed Conversion (lbs. feed/lbs. gain)[a]	Average Daily Gain (lbs./day)	Profit ($/head)	Std. Dev. Of Profit ($/head)
January	378	48.90	8.14	3.23	8.22	70.79
February	399	48.15	7.94	3.35	-10.18	61.48
March	483	47.83	7.92	3.39	-0.18	63.64
April	426	48.01	7.88	3.40	17.77	66.00
May	458	48.17	7.97	3.33	21.10	67.36
June	325	47.83	7.93	3.44	42.73	51.75
July	374	48.79	7.96	3.47	27.61	62.04
August	369	48.52	8.15	3.38	25.01	48.48
September	348	51.85	8.79	3.09	0.66	59.08
October	446	53.48	9.01	2.98	6.10	56.73
November	310	53.66	8.91	3.01	12.11	61.82
December	297	51.53	8.70	3.02	13.03	68.48

[a] *As-fed basis.*
Source: Kansas State University

the index number indicates whether price in a given month is expected to be greater or less than the annual average for a particular year. For example, the price index for 600- to 700-pound steers in August was 101.30 (Figure 9), indicating that the steer price average during August is expected to be 1.3 percent higher than the annual average. To provide a measure of variability associated with each price index, the graphs include plots of the index plus and minus one standard deviation. The range identified by the standard deviation lines indicates where the price index is expected to fall approximately 68 percent of the time.

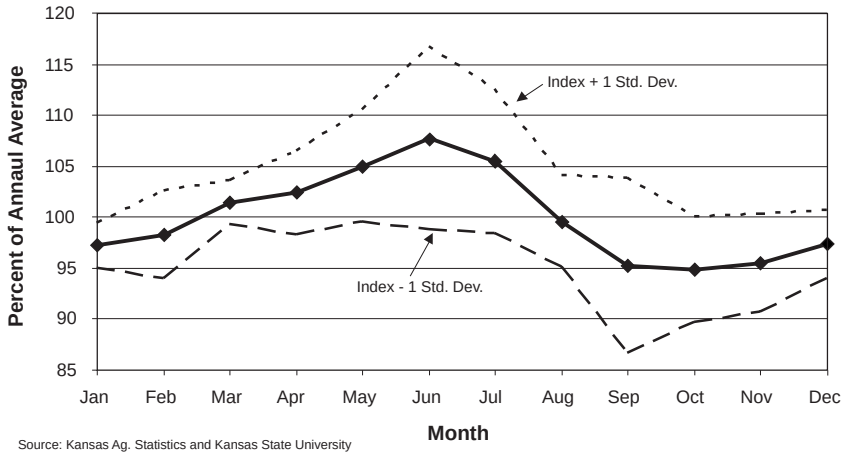
The Kansas cash corn price seasonal index (Figure 6) indicates corn prices generally bottomed out at harvest time (September and October) and strengthened throughout the storage season, until the following June. From 1985 to 1999, Kansas cash corn prices aver-

Table 4. *Average Monthly Values of Steer Feeding Factors for 800- to 899-lb. Placements (January 1985 to August 1999)*

Placement Month	Number of Pens (number)	Cost of Gain ($/cwt)	Feed Conversion (lbs. feed/lbs. gain)[a]	Average Daily Gain (lbs./day)	Profit ($/head)	Std. Dev. Of Profit ($/head)
January	152	52.08	8.45	3.32	-5.08	75.09
February	155	51.53	8.29	3.39	-6.32	57.36
March	217	50.52	8.19	3.47	-3.75	56.50
April	274	50.78	8.24	3.46	9.32	66.89
May	315	50.21	8.19	3.42	18.35	63.10
June	254	50.21	8.11	3.53	26.17	57.77
July	334	49.37	8.15	3.57	23.52	56.99
August	358	51.70	8.45	3.46	13.25	64.21
September	346	52.46	8.84	3.29	7.16	56.39
October	315	54.41	9.22	3.14	4.48	62.60
November	222	54.71	9.15	3.14	12.45	62.58
December	145	54.83	9.13	3.09	2.91	80.46

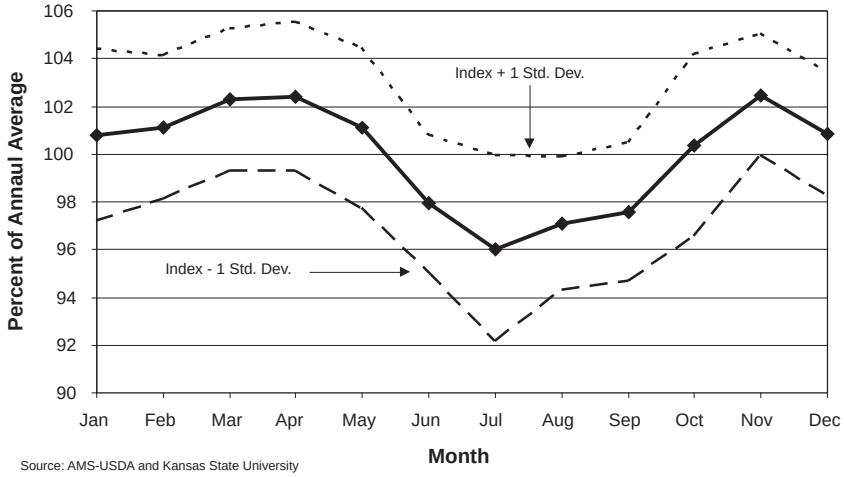
[a] *As-fed basis.*
Source: Kansas State University

Figure 6. *Kansas Corn Price Index, 1985 to 1999*



Source: Kansas Ag. Statistics and Kansas State University

Figure 7. *Western Kansas 1,100- to 1,300-lb. Fed Steer Price Index, 1985 to 1999*



Source: AMS-USDA and Kansas State University

aged about 5 percent below the annual average during harvest and 8 percent higher than the annual average in June. Corn price variability was lowest in the winter and spring.

Monthly average western Kansas direct trade prices reported by AMS-USDA for 1,100- to 1,300-pound fed steers were used to construct the fed steer seasonal price index (Figure 7). Fed steer prices were generally above the annual average price from October through May, peaking at 2.41 percent higher than the annual average in April. The spring peak in fed steer prices was primarily the result of lower beef production caused by seasonal decreases in both the number of fed cattle slaughtered and carcass weights. Fed steer prices were generally below the annual average from June through September, reaching their seasonal low in July. Prices generally strengthened from midsummer through November.

Feeder steer prices follow different seasonal patterns, depending on steer weight. Figures 8 through 11 depict price indices for 500- to 600-, 600- to 700-, 700- to 800-, and 800- to 1,000-pound feeder steers, respectively. Prices of 500- to 600-pound feeder steers followed a pronounced seasonal pattern. Light weight steer prices typically peaked in late winter and early spring and then declined the rest of the year, reaching their seasonal lows in October through December. The standard deviation of light weight feeder steer prices tended to be lowest in the late spring, when prices peaked seasonally, and became

larger during the summer months. These seasonal price trends for 500- to 600-pound steers (Figure 8) and, to a lesser extent, 600- to 700-pound steers (Figure 9), reflect strong demand for light weight cattle suitable for spring grazing and a seasonally small supply of light weight cattle in the spring. Conversely, demand for lighter weight steers was lower, and supply higher, in October through December, explaining the seasonal low in light weight feeder steer prices during the fall.

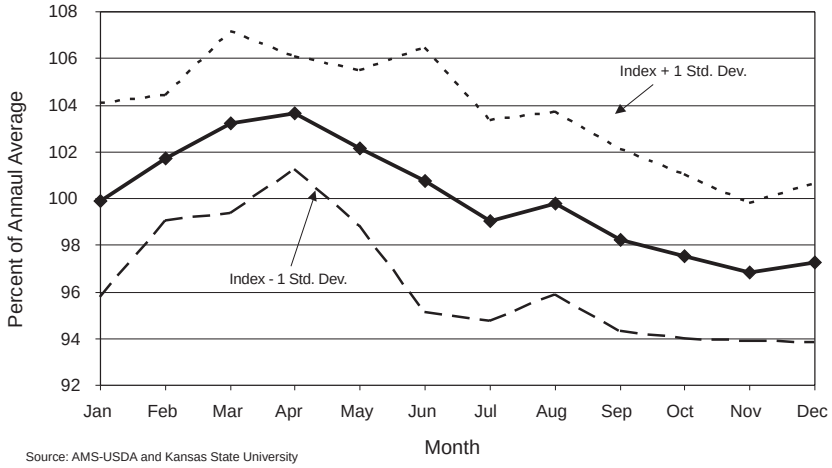
The seasonal price pattern for heavier weight feeder steers was much different than the light weight steer price pattern. Seasonal changes in heavy weight steer prices were smaller than for 500- to 600-pound steers, but larger than for 600- to 700-pound steers. For example, the seasonal price index for 600- to 700-pound steers had a high of 101.3 in August and a low of 98.64 in October (seasonal change of 2.76 percent). The seasonal price index for 700- to 800-pound feeder steers had a high of 101.81 in January and a low of 97.07 in April (seasonal change of 4.7 percent).

Prices for 700- to 800-pound feeder steers peaked in January, bottomed in the spring during April and May, recovered during the summer months, and rose above the annual average in November and December (Figure 10). The seasonal price pattern for 800- to 1,000-pound steers was similar to the 700- to 800-pound steer seasonal price pattern. Prices generally peaked during the winter, fell sharply in the spring, and recovered in the summer (Figure 11). The variation in both 700- to 800- and 800- to 1,000-pound steer prices was smallest in February and March and from September through December.

Cost of Gain and Performance Trends

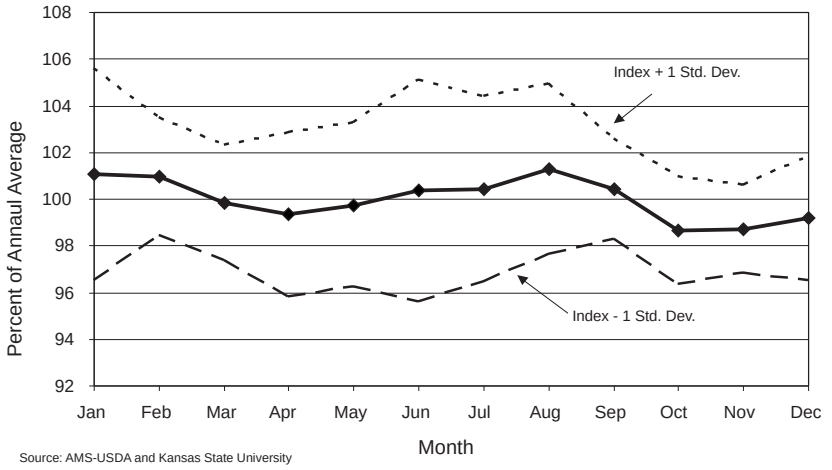
Feeding cost of gain, which does not include interest expenses, is widely used in the cattle feeding industry to compare the economic feeding performance of cattle. Feeding cost of gain reflects the effect of cattle feeding management and the animals' genetic performance, but omits the effect of purchase management strategies because it does not include interest charges on the feeder steer and feed costs. Feed ingredient cost has the greatest effect on feeding cost of gain. Total feed cost is determined by feed grain prices, forage prices, and animal performance. Higher grain and forage prices increase total feed cost. Cattle performance factors that affect feeding cost of gain include feed conversion, average daily gain, and death loss. Increases in feed conversion or death loss cause feeding cost of gain to increase, as do increases in health problems, which increase veterinary expenses and reduce performance. Figure 12 illustrates the monthly average steer feeding cost of gain for 700- to 799-pound placements. Over the 15-year time period, feeding cost of gain tended to be highest from mid-1992 through 1997 and lowest in 1998 and 1999. These time periods correspond to relatively high and low corn prices, respectively, again illustrating that feeding cost of gain's largest component is the price of feedstuffs. For example, in April 1996, the average Kansas corn price of $4.24 per bushel translated to a feeding cost of gain of $68.14 per hundredweight. Feeding cost of

Figure 8. *Dodge City 500- to 600-lb. Feeder Steer Price Index, 1985 to 1999*



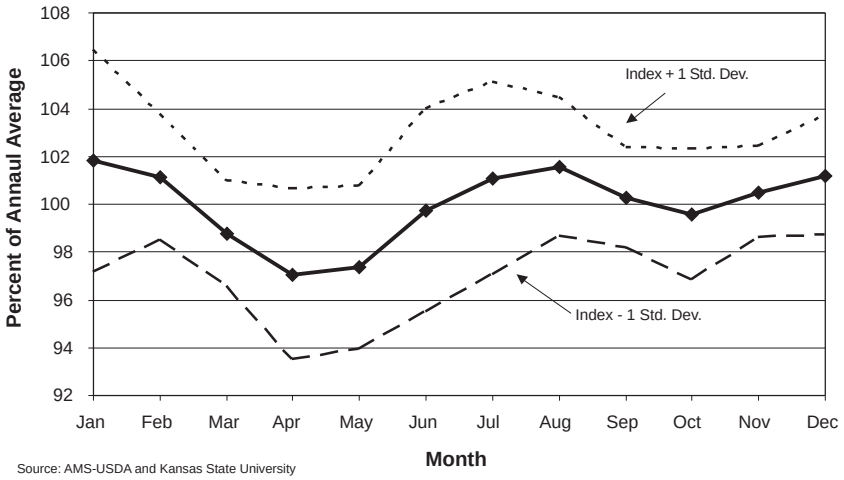
Source: AMS-USDA and Kansas State University

Figure 9. *Dodge City 600- to 700-lb. Feeder Steer Price Index, 1985 to 1999*



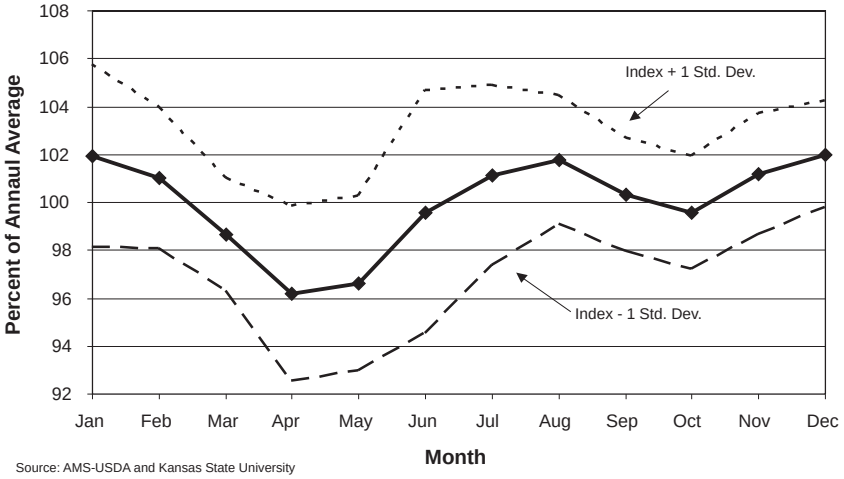
Source: AMS-USDA and Kansas State University

Figure 10. *Dodge City 700- to 800-lb. Feeder Steer Price Index, 1985 to 1999*



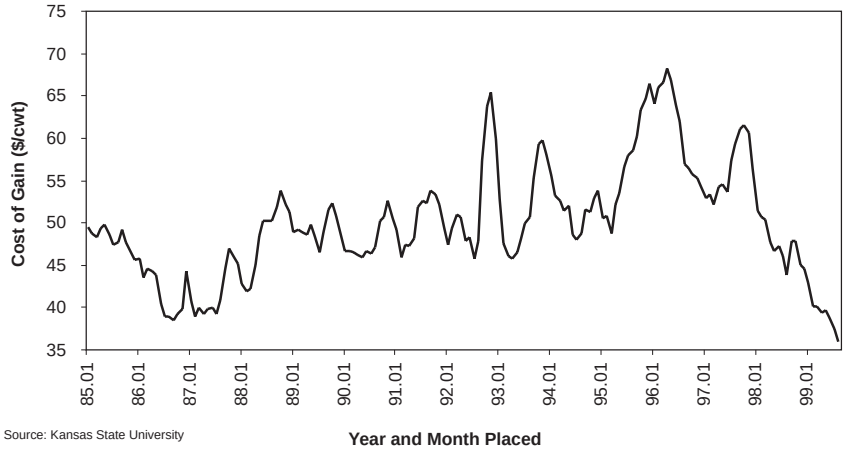
Source: AMS-USDA and Kansas State University

Figure 11. *Dodge City 800- to 1,000-lb. Feeder Steer Price Index, 1985 to 1999*



Source: AMS-USDA and Kansas State University

Figure 12. *Monthly Average Steer Feeding Cost of Gain For Steers Placed at 700 to 799 lbs.*



Source: Kansas State University

gain decreased to $38.77 per hundredweight for June 1999 placements, primarily because average corn price declined to $1.91 per bushel.

Feeding cost of gain varies seasonally and follows a different pattern for steers of various placement weights. Figure 13 illustrates the average monthly cost of gain index by placement weight, according to the month the steers were placed on feed. As with the price indices, the trend in the cost of gain data was removed prior to calculating the seasonal index. This seasonal index is interpreted as before. For example, the monthly index value of 95.3 for 600- to 700-pound steers placed on feed in February indicates that feeding cost of gain is 4.7 percent below the annual average feeding cost of gain.

Seasonality of feeding cost of gain is useful information from a management perspective. Seasonally, feeding cost of gain is lower than the annual average for steers placed from January through July and higher than the annual average for August through December steer placements. There are distinct differences in seasonal cost of gain across placement weight categories. For cattle placed on feed from November through April, the seasonal feeding cost of gain is highest for 800- to 900-pound steers (relative to its annual average), followed by 700- to 800- and 600- to 700-pound steers. The reverse is true for steers placed on feed from May through October.

The seasonal nature of feeding cost of gain is influenced by the seasonal patterns of performance factors. Figure 14 illustrates the seasonal index of feed conversions for the various steer placement weight categories. Feed conversion (measured on an as-fed basis) is a measure of how many pounds of feed are required to produce a pound of gain. Higher (lower) feed conversions are associated with higher (lower) feeding costs of gain. Feed conversions follow seasonal patterns similar to that of feeding cost of gain. In general, steers placed from January through April had the lowest seasonal average feed conversion (Figure 14).

Average daily gain seasonal indices for the three steer placement weight categories are depicted in Figure 15. Lowest average daily gains for all placement weights occurred when steers were placed on feed during the fall (and were fed during the winter). Highest seasonal

average daily gains for light weight steers were for March placements, whereas heavier weight steers had the best daily gains when placed on feed during July. Differences in seasonal patterns of average daily gain across placement weights are important to consider when projecting the cost of finishing steers.

Conclusions

This publication illustrates historical and seasonal trends in cattle performance and economic factors that influence steer feeding profitability. Along with cash corn and cattle price data, pen level closeout data for steers placed on feed from January 1985 to August 1999 at two western Kansas custom feedyards were analyzed in this study.

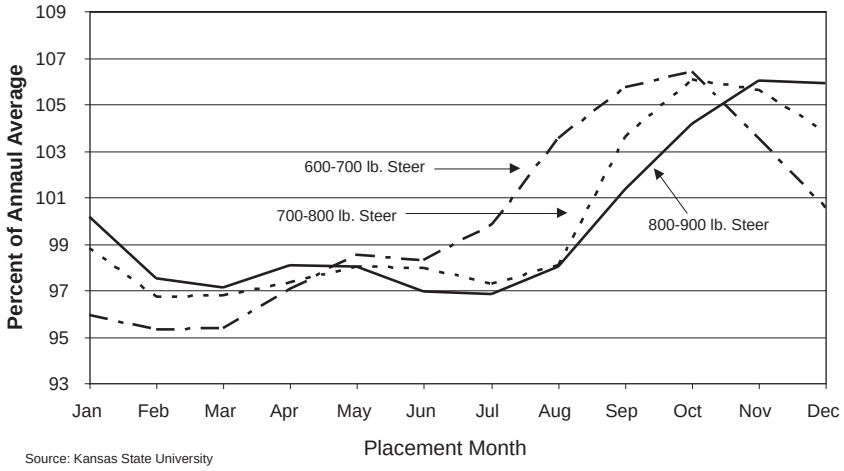
Results indicate that steers placed on feed during the spring months tended to have the lowest feed conversions and highest average daily gains, translating into seasonally low feeding cost of gains. Higher feeding cost of gains for fall and winter steer placements resulted from higher feed conversions and lower average daily gains.

Corn prices in Kansas were usually lowest during harvest time (September and October) and increased seasonally throughout the storage period until June. Fed steer prices tended to reach their seasonal peaks in late winter and early spring, with the lowest prices generally occurring in the summer. Light weight feeder steer prices were usually highest in late winter and early spring, and lowest in the fall. Conversely, prices for heavy weight feeder steers reached their peak in early winter and declined markedly by mid-spring.

Seasonal profit patterns varied by steer placement weight, but generally steers placed on feed in late winter and early spring were less profitable than the same weight steers placed in late spring through early summer. Moreover, profit variability for steers placed on feed during the summer is generally lower than for fall, winter, and spring placements.

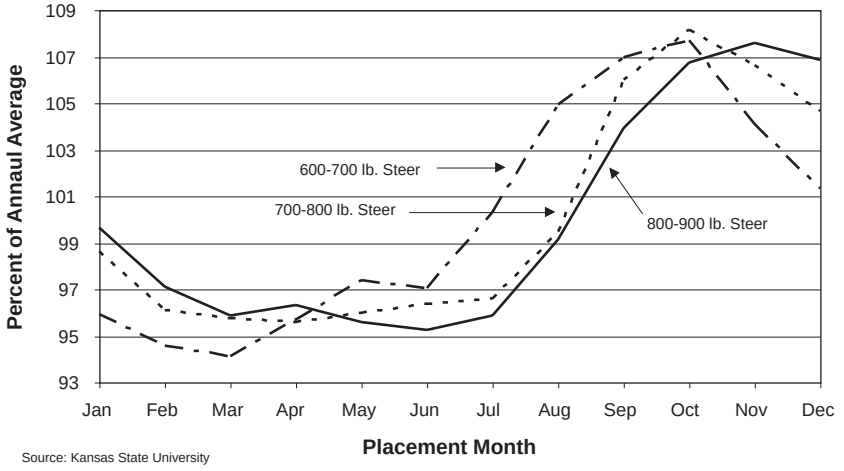
Cattle feeders can use the information in this report to increase profitability by developing improved projections for feeding cost of gain and breakeven prices for specific feedlot steer placements. Cattle feeding management strategies can also be improved by using seasonal price and profit information.

Figure 13. *Seasonal Index of Steer Feeding Cost of Gain by Placement Weight, Jan 1985 to Aug 1999*



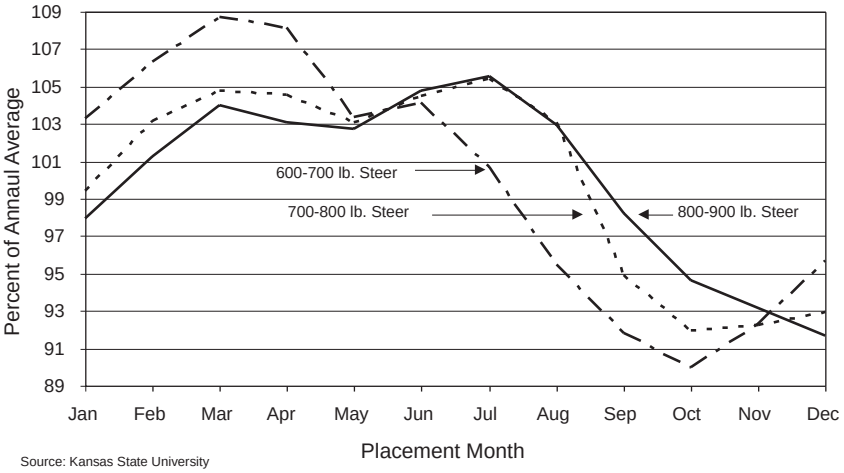
Source: Kansas State University

Figure 14. *Seasonal Index of Steer Feed Conversion by Placement Weight, Jan 1985 to Aug 1999*



Source: Kansas State University

Figure 15. *Seasonal Index of Steer Average Daily Gain by Placement Weight, Jan 1985 to June 1999*



Source: Kansas State University

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Darrell R. Mark
Agricultural Economist
Department of Agricultural Economics
University of Nebraska - Lincoln

Rodney Jones
Agricultural Economist
Livestock Production

James Mintert
Agricultural Economist
Livestock Marketing

Kansas State University Agricultural Experiment Station and Cooperative Extension Service

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