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# Managing for Today's Cattle Market and Beyond

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## *Cattle Price Seasonality*

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### **Introduction**

Seasonal price patterns are normal price movements or fluctuations that occur within a year. Recognizing the presence and magnitude of seasonal price patterns can improve many cattle producer marketing and production management decisions. But producers must also be aware that other factors such as market price trends (general long-term price direction) and price cycles<sup>1</sup> (pattern of prices over several years) also are important.

Agricultural production is driven by climatic seasons and biological factors that result in supplies changing over the year. The timing of calf weaning and stocker animal production are greatly influenced by climatic season, which in turn creates seasonality in animal sales and animal movements. Additionally, demand for many agricultural products is seasonal. When combined, seasonal supply and demand factors (direct and derived from subsequent stages along the marketing chain) create seasonal price patterns. When opposite of "normal" seasonal conditions emerge, market participants often refer to the situation as being counter-seasonal.

Seasonal price patterns tend to differ depending on cattle class (cow, calf, yearling, fed cattle). There also can be differences in seasonal price patterns within cattle classes based on geographic location.

### **Price Seasonality Defined**

Cattle price seasonality is defined as regular or average cattle price patterns occurring within a year. Typically, seasonal patterns for livestock are developed on a calendar year basis and crops are developed based on crop-years.

Seasonal price patterns are usually calculated as an index whose values represent average price levels at a particular point in time relative to the annual average price. Usually, seasonal indices are calculated from monthly average prices. The result is an index where the annual average price is given an index value of 1 or 100 and each time period (monthly) index value represents the percentage deviation from the annual average price level. For example, for 400-500 pound steers sold in Alabama (table 1), a March price index value of 1.05 or 105 means that March prices tend to be 5 percent above the average annual price (1.05 x annual average price). An October index value of 0.951 or 95.1 means that October prices tend to average about 5 percent below the annual average price (0.951 x annual average price).

Seasonal price patterns are calculated from historically observed prices<sup>2</sup>. Data should be collected for a period of time covering one complete cycle. Indices reported here are based on data collected from USDA's Agricultural Marketing Service and cover a period of ten years (1991-2000).

With several years of data, the variability of seasonal prices can also be calculated as a standard deviation at each point in time during the year.

Some times during the year may inherently be more price volatile and the difference between the maximum and minimum index for that month over the entire period examined will grow increasingly wide. There is also a larger standard deviation around the seasonal price index for those months. Thus the confidence or range of variation that one would expect for prices in a given month will vary according to the standard deviation of prices in that month. Tables 1-6 contain 10 year average seasonal price indices and standard deviations for feeder cattle and slaughter cows for six regions of the country. Table 7 contains fed cattle seasonal price indices for Amarillo and Western Kansas.

### ***Price Seasonality by Cattle Class***

Cattle price seasonality is generally most pronounced for lighter weight animals (calves) and generally dampens in magnitude for larger animals (feeder and fed cattle). Cull cows, however, have the largest seasonal price swings of all cattle classes. Figure 1 shows a comparison of seasonal price patterns for Texas markets.

Moreover, the general seasonal pattern of price varies across different classes of animals. For calves, prices tend to be higher in the first half of the year and lower in the second half of the year (figures 2 and 3). This reflects a combination of supply -- the majority of calves are spring born and marketed as weanling calves in the fall -- and demand conditions -- demand for stocker cattle and cows is generally greater nationwide in the spring as forage production begins to accelerate.

Prices for cows exhibit a pronounced seasonal low in the fall (figure 4). This pattern is the result of dominant production patterns. The majority of beef cows calve in the spring and therefore are culled in the fall after weaning and the producer is confident that the animal was not able to breed back. But, the seasonal pattern can be overwhelmed during periods in the cattle cycle when liquidation or expansion is taking place<sup>3</sup>.

Feeder cattle (700-800 lb steers) have complicated and diverse seasonal price patterns (figures 5 through 10). Generally, feeder cattle price exhibit two low periods in the spring and fall with

summer and winter price peaks. Fed cattle have seasonal price lows in the summer (figure 11).

### ***Regional Differences in Price Seasonality***

Cow-calf production differs widely in different parts of the country. Seasonal availability of calves differs due to forage growing seasons and cattle production practices, such as fall calving in southern regions. Although generally similar, seasonal price patterns for different classes of cattle will vary in magnitude and exact timing of highs and lows in different parts of the country.

### ***Using Seasonal Price Indices to Project Prices***

In a stable cattle market environment, seasonal price patterns are baseline market indicators and thus are useful starting points for price projections. Combining seasonal price patterns with current market information provides a simple tool to project current market conditions into the future. A simple procedure to project future prices from current prices is given by:

$$(1) \quad P_{\text{future}} = P_{\text{current}} (\text{Index}_{\text{future}} / \text{Index}_{\text{current}})$$

For example, if we observe that the November price of 400-500 pound steers in Oklahoma is \$100/cwt., we can project the March price of 400-500 pound steers as:

$$P_{\text{March}} = \$100 (1.056/0.973) = \$108.53$$

In this example, we used the March index value of 1.056 and the current (November) index value of 0.973 from Table 4.

We might be interested in determining the most likely range within which the March price will fall. The standard deviation is a measure of the likely variation in the future index value. By adding or subtracting one standard deviation from the future index we can calculate the range within which the future price will most likely fall. In the example above, the March price of 400-500 pound steers in Oklahoma is most likely to fall in the range of \$106.27 [ $\$100((1.056-0.022)/0.973)$ ] to \$110.79 [ $\$100((1.056+0.022)/0.973)$ ]<sup>4</sup>.

The above procedure for projecting future prices should be viewed as only the first step in evaluating market conditions. The projection made above assumes that current prices accurately reflect supply and demand conditions and that markets are

stable, i.e. not trending up or down. Seasonal price projections calculated according to this procedure may need to be adjusted up or down given one's perception of other (nonseasonal) factors that may be influencing market prices over time.

**Table 1. Alabama Cattle Price Seasonal Indices, 1991-2000 Average**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
400-500 LB STEERS	1.030 (0.037)	1.050 (0.045)	1.079 (0.023)	1.051 (0.050)	1.000 (0.041)	0.991 (0.024)	0.983 (0.048)	0.965 (0.048)	0.958 (0.044)	0.951 (0.016)	0.959 (0.026)	0.982 (0.038)
500-600 LB STEERS	1.020 (0.032)	1.039 (0.040)	1.070 (0.023)	1.051 (0.039)	1.007 (0.038)	0.999 (0.027)	0.999 (0.041)	0.978 (0.039)	0.957 (0.035)	0.946 (0.017)	0.954 (0.024)	0.979 (0.029)
700-800 LB STEERS	1.012 (0.026)	1.018 (0.020)	1.016 (0.026)	0.998 (0.041)	0.999 (0.036)	1.013 (0.026)	1.011 (0.031)	1.006 (0.037)	0.984 (0.029)	0.974 (0.019)	0.973 (0.017)	0.996 (0.036)
UTLITY COWS	0.996 (0.032)	1.054 (0.023)	1.061 (0.031)	1.056 (0.031)	1.068 (0.032)	1.056 (0.031)	1.012 (0.027)	1.000 (0.024)	0.940 (0.030)	0.910 (0.031)	0.908 (0.031)	0.940 (0.023)

Standard Deviations in ( ).

**Table 2. Colorado Cattle Price Seasonal Indices, 1991-2000 Average**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
400-500 LB STEERS	1.037 (0.048)	1.059 (0.049)	1.072 (0.037)	1.046 (0.043)	1.038 (0.032)	1.016 (0.053)	0.972 (0.062)	0.923 (0.153)	0.942 (0.070)	0.951 (0.026)	0.970 (0.037)	0.976 (0.049)
500-600 LB STEERS	1.006 (0.029)	1.029 (0.023)	1.059 (0.018)	1.057 (0.030)	1.046 (0.033)	1.025 (0.045)	0.998 (0.029)	0.966 (0.035)	0.952 (0.041)	0.949 (0.017)	0.950 (0.023)	0.964 (0.034)
700-800 LB STEERS	1.023 (0.022)	1.006 (0.018)	0.992 (0.026)	0.986 (0.045)	0.979 (0.033)	0.986 (0.032)	1.006 (0.037)	1.009 (0.031)	0.999 (0.031)	1.001 (0.021)	1.005 (0.023)	1.008 (0.035)
UTLITY COWS	0.981 (0.043)	1.028 (0.028)	1.043 (0.029)	1.032 (0.047)	1.037 (0.031)	1.042 (0.021)	1.043 (0.022)	1.035 (0.023)	0.984 (0.027)	0.936 (0.023)	0.899 (0.021)	0.940 (0.027)

Standard Deviations in ( ).

**Table 3. Montana Cattle Price Seasonal Indices, 1991-2000 Average**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
400-500 LB STEERS	1.027 (0.036)	1.053 (0.027)	1.054 (0.022)	1.029 (0.029)	1.016 (0.027)	0.989 (0.036)	0.969 (0.041)	0.970 (0.053)	0.966 (0.042)	0.962 (0.021)	0.974 (0.017)	0.991 (0.029)
500-600 LB STEERS	1.016 (0.028)	1.050 (0.023)	1.061 (0.024)	1.045 (0.032)	1.023 (0.032)	1.027 (0.034)	0.980 (0.045)	0.946 (0.051)	0.965 (0.032)	0.959 (0.014)	0.956 (0.014)	0.973 (0.019)
700-800 LB STEERS	1.012 (0.026)	1.002 (0.015)	0.995 (0.027)	0.992 (0.042)	0.989 (0.038)	1.011 (0.037)	1.010 (0.026)	0.999 (0.038)	1.001 (0.023)	1.003 (0.019)	0.992 (0.021)	0.994 (0.029)
UTLITY COWS	0.961 (0.031)	1.011 (0.030)	1.040 (0.029)	1.029 (0.052)	1.043 (0.043)	1.048 (0.022)	1.058 (0.022)	1.051 (0.036)	0.996 (0.034)	0.945 (0.040)	0.898 (0.040)	0.921 (0.020)

Standard Deviations in ( ).

**Table 4. Oklahoma Cattle Price Seasonal Indices, 1991-2000 Average**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
400-500 LB STEERS	1.002 (0.036)	1.037 (0.019)	1.056 (0.022)	1.048 (0.035)	1.012 (0.057)	0.998 (0.027)	0.989 (0.042)	0.986 (0.044)	0.961 (0.040)	0.947 (0.020)	0.973 (0.023)	0.991 (0.037)
500-600 LB STEERS	0.992 (0.030)	1.024 (0.021)	1.053 (0.023)	1.048 (0.037)	1.016 (0.036)	1.013 (0.026)	1.006 (0.039)	0.995 (0.036)	0.961 (0.037)	0.946 (0.021)	0.965 (0.018)	0.982 (0.032)
700-800 LB STEERS	1.008 (0.023)	0.997 (0.019)	0.980 (0.024)	0.977 (0.035)	0.977 (0.034)	1.007 (0.025)	1.016 (0.030)	1.006 (0.028)	0.993 (0.026)	0.998 (0.020)	1.014 (0.021)	1.027 (0.031)
UTILITY COWS	0.984 (0.035)	1.035 (0.031)	1.052 (0.024)	1.039 (0.042)	1.031 (0.031)	1.037 (0.022)	1.034 (0.037)	1.025 (0.026)	0.977 (0.024)	0.930 (0.028)	0.908 (0.025)	0.949 (0.018)

Standard Deviations in ( ).

**Table 5. Texas Cattle Price Seasonal Indices, 1991-2000 Average**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
400-500 LB STEERS	1.008 (0.035)	1.044 (0.024)	1.059 (0.019)	1.060 (0.039)	0.995 (0.047)	1.000 (0.026)	1.006 (0.033)	0.995 (0.036)	0.961 (0.041)	0.946 (0.035)	0.953 (0.033)	0.973 (0.042)
500-600 LB STEERS	0.994 (0.025)	1.036 (0.015)	1.061 (0.019)	1.058 (0.042)	1.019 (0.036)	1.016 (0.024)	1.013 (0.028)	0.998 (0.031)	0.960 (0.043)	0.942 (0.020)	0.946 (0.032)	0.956 (0.036)
700-800 LB STEERS	1.009 (0.024)	1.018 (0.022)	1.019 (0.029)	1.015 (0.046)	0.986 (0.042)	1.001 (0.035)	1.025 (0.030)	1.012 (0.032)	0.986 (0.040)	0.976 (0.015)	0.971 (0.043)	0.982 (0.036)
UTILITY COWS	0.998 (0.042)	1.054 (0.043)	1.060 (0.029)	1.045 (0.048)	1.009 (0.048)	1.042 (0.028)	1.021 (0.040)	1.022 (0.028)	0.971 (0.035)	0.922 (0.029)	0.912 (0.035)	0.945 (0.020)

Standard Deviations in ( ).

**Table 6. Pacific Northwest Cattle Price Seasonal Indices, 1991-2000 Average**

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
400-500 LB STEERS	1.004 (0.035)	1.020 (0.030)	1.046 (0.036)	1.063 (0.034)	1.045 (0.036)	1.026 (0.027)	1.021 (0.037)	0.977 (0.052)	0.941 (0.039)	0.942 (0.025)	0.950 (0.024)	0.965 (0.029)
500-600 LB STEERS	0.999 (0.027)	1.017 (0.033)	1.048 (0.040)	1.062 (0.030)	1.048 (0.042)	1.025 (0.012)	1.001 (0.037)	0.977 (0.035)	0.960 (0.037)	0.949 (0.022)	0.949 (0.021)	0.964 (0.022)
700-800 LB STEERS	1.007 (0.027)	1.005 (0.021)	1.002 (0.028)	1.011 (0.043)	1.011 (0.026)	1.017 (0.032)	1.017 (0.032)	1.000 (0.044)	0.979 (0.027)	0.982 (0.019)	0.974 (0.013)	0.994 (0.028)
UTILITY COWS	0.972 (0.034)	1.020 (0.037)	1.048 (0.046)	1.034 (0.055)	1.059 (0.031)	1.054 (0.031)	1.054 (0.026)	1.025 (0.029)	0.979 (0.036)	0.935 (0.034)	0.891 (0.039)	0.929 (0.037)

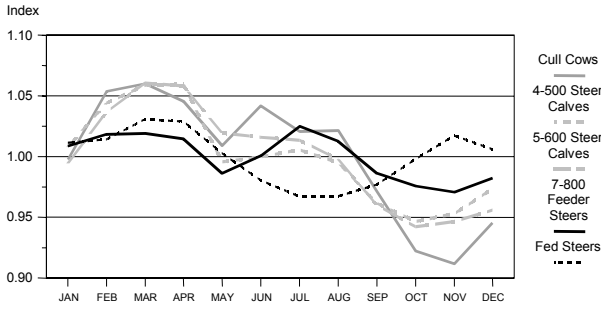
Standard Deviations in ( ).

**Table 7. 1100-1300 Pound Slaughter Steer Price Seasonal Indices, 1991-2000 Average**

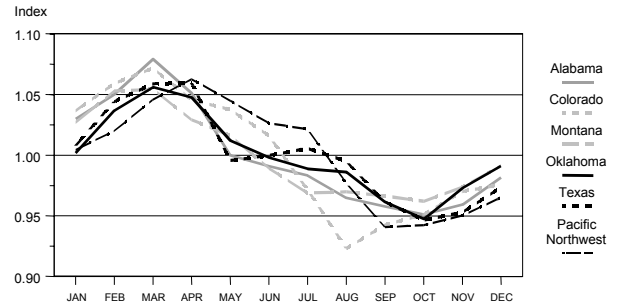
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Amarillo	1.011 (0.026)	1.014 (0.035)	1.031 (0.032)	1.029 (0.045)	1.003 (0.042)	0.980 (0.037)	0.967 (0.020)	0.967 (0.034)	0.977 (0.045)	0.998 (0.038)	1.017 (0.030)	1.006 (0.027)
Western Kansas	1.010 (0.025)	1.012 (0.035)	1.031 (0.032)	1.031 (0.047)	1.004 (0.043)	0.980 (0.037)	0.965 (0.020)	0.968 (0.034)	0.979 (0.046)	0.999 (0.039)	1.017 (0.030)	1.005 (0.029)

Standard Deviations in ( ).

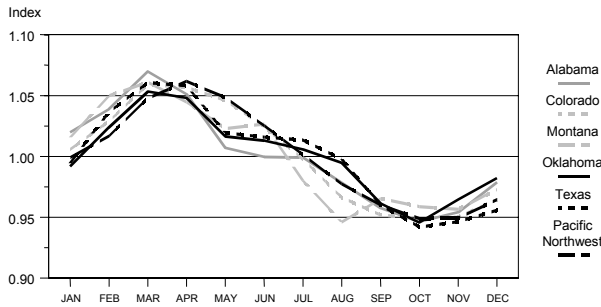
**FIGURE 1. SEASONAL PRICE INDEXES -- TEXAS**  
By Cattle Class, 1991-2000



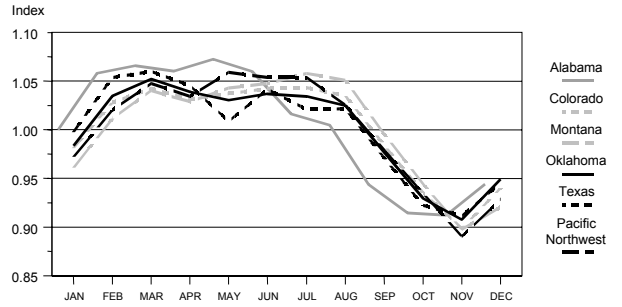
**FIGURE 2. SEASONAL PRICE INDEXES -- STEER CALVES**  
Various Markets, 400-500 Pounds, 1991-2000



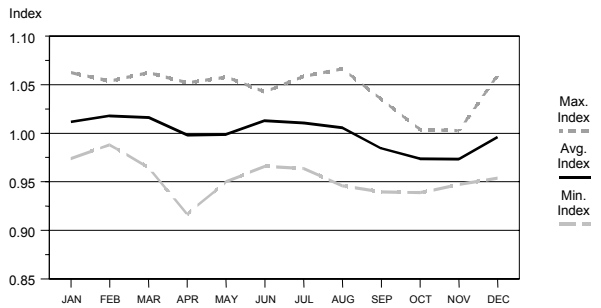
**FIGURE 3. SEASONAL PRICE INDEXES -- STEER CALVES**  
Various Markets, 500-600 Pounds, 1991-2000



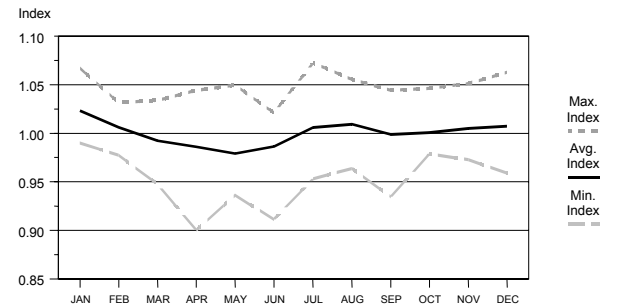
**FIGURE 4. SEASONAL PRICE INDEXES -- UTILITY COWS**  
Various Markets, 1991-2000



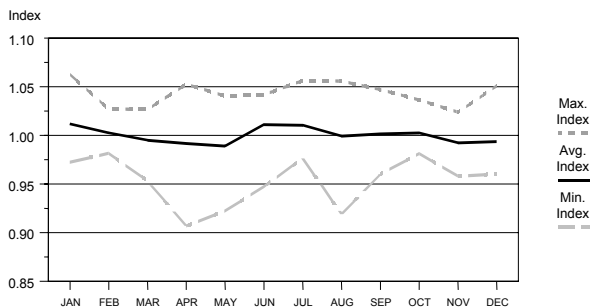
**FIGURE 5. SEASONAL PRICE INDEX -- FEEDER STEERS**  
Alabama, 700-800 Pounds, 1991-2000



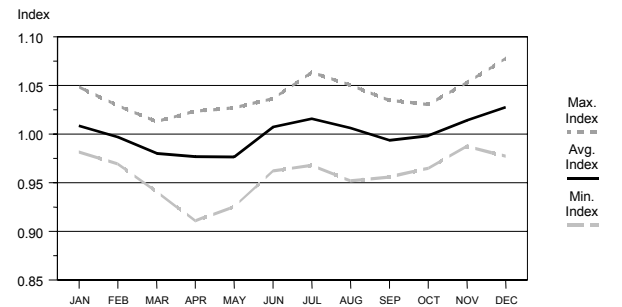
**FIGURE 6. SEASONAL PRICE INDEX -- FEEDER STEERS**  
Colorado, 700-800 Pounds, 1991-2000



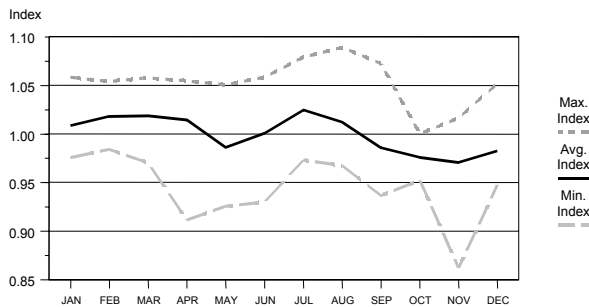
**FIGURE 7. SEASONAL PRICE INDEX -- FEEDER STEERS**  
Montana, 700-800 Pounds, 1991-2000



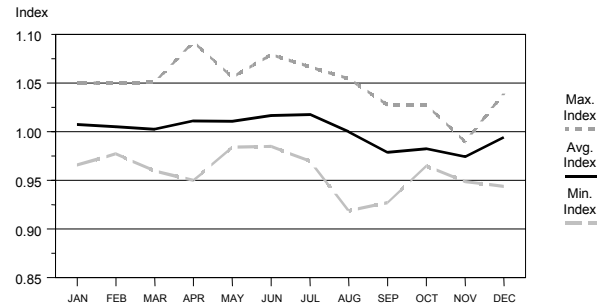
**FIGURE 8. SEASONAL PRICE INDEX -- FEEDER STEERS**  
Oklahoma, 700-800 Pounds, 1991-2000



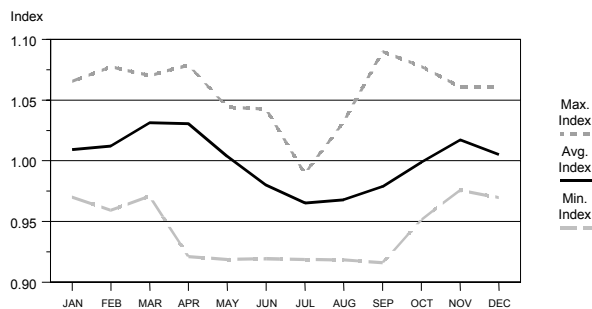
**FIGURE 9. SEASONAL PRICE INDEX -- FEEDER STEERS**  
Texas, 700-800 Pounds, 1991-2000



**FIGURE 10. SEASONAL PRICE INDEX -- FEEDER STEERS**  
Pacific Northwest, 700-800 Pounds, 1991-2000



**FIGURE 11. SEASONAL PRICE INDEX -- FED STEERS**  
Western Kansas, 1100-1300 Pounds, 1991-2000



<sup>1</sup> For a more detailed discussion of cattle cycles, see “The Cattle Cycle” by David P. Anderson, James G. Robb and James Mintert in the “Cattle Market Environment” section of Managing for Today’s Cattle Market and Beyond.

<sup>2</sup> There are several methods to calculate seasonal indices. Many approaches attempt to remove the bulk of the trend and cyclical influences of the data. Index values that are reported are usually an average over a period of years. A centered moving average approach to calculating seasonal price indices on a monthly basis was used for this paper. Market analysts, including the staff of the Livestock Marketing Information Center, have used this method extensively. More details about the method can be obtained from the authors.

<sup>3</sup> For a detailed discussion of marketing cull cows, see “Feeding and Marketing Cull Cows” by Dillon M. Feuz in the “Marketing” section of the Managing for Today’s Cattle Market and Beyond.

<sup>4</sup> Statistically this calculation means that there is a 66 2/3% probability of price being within the calculated range, a 16 2/3 % probability of the price being higher than the upper end of the range and a 16 2/3% probability of being lower than the lower end of the price range.