



## Marketing and Feeding Cull Cows

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Cull cows often are overlooked as a source of income to the cow-calf enterprise. Depending upon the relationships between cull cow and calf prices, and the herd culling rate, cull cow receipts generally account for 15 to 30 percent of cash receipts from the cow-calf enterprise. However, some producers give little attention to this source of income and ways of enhancing it. For many producers, cull cows are sold at the time they are culled from the herd. Much of this culling is done in the late fall soon after calves are weaned. Is it most profitable to sell cows when they are culled, or should they be fed for a period of time? Several factors need to be considered to properly answer that question.

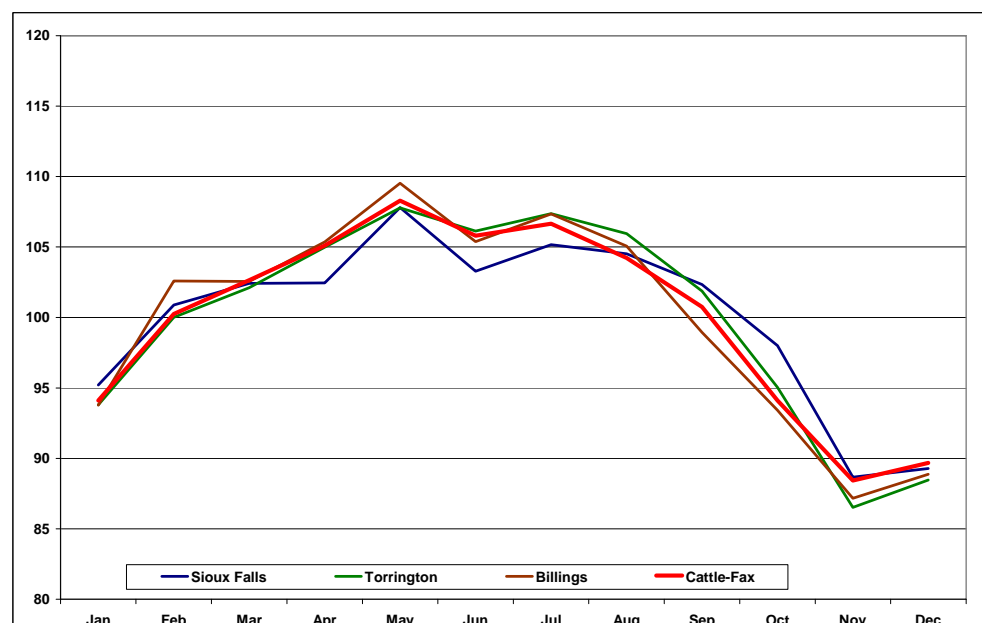
Three factors, important to the decision to sell cows when culled versus feeding them and selling at a later time, are: (1) seasonality of cull cow prices, (2) price differences between slaughter grades and number of cows in each grade, and (3) cost of feeding cull cows. Each of these factors will be discussed in some detail.

### Price Seasonality

Cull cow prices generally follow a consistent seasonal pattern. Prices normally are the lowest October through January and are the highest from April through August. If overall cattle prices are rising/declining sharply in a year, then this price pattern may not be as apparent. However, from 1980-2009 there was only one

year when the price for cull cows was higher in November than it was in August.

Figure 1 is a graph of the seasonal price pattern at three specific locations as well as a national average as represented by Cattle-Fax for 2005-2009 for Utility (Boner) grade cows. This price pattern has remained fairly consistent over time, is fairly consistent among all cull cow grades, and is consistent over many other markets that were analyzed. The vertical axis for the chart is the percent of the annual average. This is obtained by dividing each monthly price by the annual average price and then multiplying by 100. In the case of the graph in Figure 1, 5 years of these monthly index values have been averaged to obtain each average monthly index.



**Figure 1.** Average Monthly Seasonal Cull Cow Index Values, 2005-2009.

These index values are useful for short-term price planning (forecasting) purposes. For example, suppose it is November and you have just culled your cows. The price at the local auction last week was \$40/cwt. You are considering feeding the cows for 90 day. What price might you expect in February? By dividing the current price by that monthly index and then multiplying by the index value for the month in the future when you plan to sell, you can generate a price forecast based on the historical seasonal pattern. Continuing with our example by using the Torrington, WY seasonal graph I would predict a price of \$46.21/cwt ( $\$40/87*100.5 = \$46.21$ ) in February.

Understanding seasonal price patterns can help you plan your marketing strategy. However, a cautionary note, selling at the highest price will not guarantee the largest profit, nor will selling at the lowest price necessarily lead to the least profit. There is a cost to feeding animals into future time periods and culling early may not be feasible for some operations.

### Cow Slaughter Grades

Prices for cull cows are based on their USDA carcass grade or their expected carcass grade. The most common grades, in order of the least amount of marbling to the greatest amount of marbling are: Canner, Cutter, Utility, and Commercial. Frequently, the grades are not reported but Canner and Cutter are reported in the Lean market class and Utility is reported as Boner or Breaker. If the cows have been grain fed for some time, those in the Commercial grade may qualify for the Premium White Fat market class. Table 1 displays the USDA Grades, USDA-AMS reported market classes and approximate corresponding body condition score (BCS) of the cows.

**Table 1.** Cull Cow Grades, Market Classes and Body Condition Score.

USDA Grade	Market Class	BCS
Canner	Lean	2-3
Cutter	Lean	3-4
Boning Utility	Boners	5
Breaking Utility	Breakers	6-7
Commercial	Premium White Fat	7-9

Price differences between these grades impact the price of cull cows directly if a producer sells on a carcass weight and grade basis, and indirectly if the cow is sold on a live weight basis. These price differentials vary from year to year and also from month to month within a year. The differential is wider in higher priced years and in the fourth quarter of the year. Average price differentials between market classes at Torrington, WY from 2005 - 2009 are displayed in Table 2. These differences also are consistent with several other markets. The Commercial grade or White Fat market class is frequently not reported. When it is, the price is typically 10% higher than the Breaker prices at the same auction.

**Table 2.** Percentage Price Increase Between Market Classes at Torrington, WY, 2005-2009.

	Boner	Breaker
Lean	7.5%	11.0%
Boner		3.5%

### Cow Weight and BCS

Depending upon the weight and frame of a cow, it requires about 60-80 lbs of weight gain to increase one BCS. A cow with a BCS of 3 in the Lean Market Class would require about 140 lbs of gain to get to a BCS of 5 and into the Boner Market Class. A cow with a BCS of 4 in the Lean Market Class would only require about 70 lbs of gain to get to a BCS of 5 and into the Boner Market Class. A cow with a BCS of 3 in the Lean Market Class would require almost 300 lbs of gain to get to a BCS of 7 and into the Commercial Market Class.

At different times of the year a cow may be gaining weight or losing weight based on the quantity and quality of the forage they are consuming.

Considering the fact that many cows may be losing weight and BCS during the fall, they may be sliding from the Boner to the Lean market class.

Furthermore, the seasonal price pattern is that prices are typically declining through the fall. Therefore, where possible culling earlier in the fall rather than later will likely result in a higher market price and more weight being sold.

A cautionary note on weight change, cow grade and market price is needed. Weight is objectively measured by the scale. A market observer at the auction assigns the grade or market class based on a subjective visual appraisal of how he/she thinks the cow will grade. Buyers bidding against one another determine the actual price and they may see the cattle differently than the market reporter. Each buyer may also have a different preference for thin versus fat cows, depending on if they intend to feed the cow or butcher the cow. One more caution on weight and cow price: different packers have different market outlets for cow beef. Therefore, some will want fatter cows and others will desire leaner cows. If you are planning on selling your cull cows direct to a packer, it is probably worth your time to determine if they are paying more for fatter or leaner cows.

### Cow Feeding Alternatives

There are many ways to feed a cow and depending upon the ration a cow may be losing a pound per day or gaining up to four pounds per day. If a producer culls a cow in the fall and wants to feed her to take advantage of seasonal price increases, what is the optimal rate of gain for a cow? How many days should the cow be fed? The answer to these questions will depend upon the initial cow weight and BCS, the availability and cost of various feed sources and the current price of cull cows.

Three simple cull cow rations are presented in Table 3. Increased gains at perhaps reduced cost might be obtained using alternative feeds. These rations are used to primarily illustrate differences in weight gain, BCS change and ultimately expected sale price. For each ration the pounds of feed is listed on as as-fed basis. The expected average daily gain (ADG) is displayed and the expected change in the cows BCS following 90 days on the ration is displayed. The NRC Requirements for Beef Cattle software was used to validate these rations.

The first ration is an all hay ration that might be used by a producer who has no grain or silage and does not want to purchase any feed. The second ration is a silage-hay ration with a higher rate of gain than the hay ration. The last ration is an 80% corn grain ration. This is truly a cow fattening ration. Some trials have shown cows gaining up to 4.0 lbs per day on this type of ration.

**Table 3.** Three Cull Cow Rations, the Expected Average Daily Gain and BCS Change after 90 Days on Feed (feed is lbs/day, as-fed basis).

	Hay	Silage	Grain
Grass hay	12.5		
Alfalfa hay	12.0	12.0	6.5
Corn silage		37.0	
Corn grain			26.0
ADG	1.25	2.0	3.0
BCS change	1.5	2.5	3.5

### Cost of Feeding

Revenue can often be increased by feeding cull cows due to seasonal prices, weight gains, and slaughter grade changes. However, that doesn't automatically imply a profit from feeding. The cost of the feeding program must be considered. The primary cost in feeding is the feed cost. A charge for labor and facilities (yardage), interest on the cull cow and one half of the other variable costs, and death loss should all be considered.

Feed costs will vary depending upon the price of feed and the feedstuffs used in the ration. Proper procedures should be used to balance a ration for the cows and determine the cost of feed. A cost of around \$0.30 per day is often charged at a commercial feed yard. If you are feeding the cows yourself, than this yardage charge would represent a payment to you for your facilities, labor and management. If you just want to consider out of pocket costs, then upkeep on your facilities will likely be less than \$0.30 per head per day. Interest on the value of the cull cow at the time she is placed on feed should be charged until she is sold. For example, if you could sell the cull cow for \$400 and if you are paying 8% interest and you plan on feeding the cow for 90 days, the interest charge would be \$7.89 per head [ $\$400 \times .08 \times (90/365) = \$7.89$ ].

### Partial Budget Analysis

The proper manner to consider all of these factors is to construct a partial budget and evaluate if it would be more profitable to feed the cull cow rather than selling when culling takes place. The partial budget will have three main sections: (1) the expected revenue at the end of the feeding period, (2) the additional costs from feeding the cull cow, and (3)

the revenue lost by not selling the cull cow at the time of culling (opportunity cost).

When calculating expected revenue, weight gain, price changes due to seasonal variations, and price change because of grade changes all should be considered. Feed costs, yardage, death loss, and interest should be computed to estimate feeding costs.

Table 4, contains an example of the expected returns from each ration. The assumptions are that the cows weigh 1050 lbs, have a BCS of 4, and the market price for Lean cows is \$40/cwt. in November. Alfalfa is \$90/ton, grass is \$76.50/ton, corn silage is \$33.75/ton, and corn grain is \$3.75/bushel. The cows are fed for 90 days and sold in February. To illustrate how the sale value was determined, the focus is on the silage ration. The cow will gain 2.5 lbs/day for 90 day and there end weight will be 1230 lbs. Since they were BCS 4 in November and this ration is expected to increase BCS by 2.5 after 90 days, they should be 6.5 in February. In November, they would have been in the Lean market class and by February many should be in the Breaker market class. To determine the expected market price, first account for the seasonal price increase, and then the grade price increase as follows:

$$\$40/87 * 101 = \$46.44 \quad 46.44 * 1.11 = \$51.55.$$

That is the price in November divided by the seasonal index in November, times the seasonal index in February, and then that price times the 11% increase from Lean to Breaker (Table 2). The sale value is  $\$.5155 * 1230 = \$634$ .

**Table 4.** Example Partial Budgets for Each Sample Ration

	Hay	Silage	Grain
Sale Value	\$580.31	\$634.00	\$711.04
Initial Value	<u>420.00</u>	<u>420.00</u>	<u>420.00</u>
Feed Margin	160.31	214.00	291.04
Less			
Feed	91.63	104.79	183.02
Yardage	27.00	27.00	27.00
Interest	9.19	9.32	10.09
Other	<u>5.00</u>	<u>5.00</u>	<u>5.00</u>
<b>Net Return</b>	<b>\$27.49</b>	<b>\$67.89</b>	<b>\$65.93</b>

## Sensitivity Analysis

How sensitive to feed costs and cull cow prices are the returns to cull cow feeding? Cull cow prices were varied from \$35/cwt. to \$50/cwt. for the price of a Lean cull cow in November. The price of corn grain was varied from \$3.00/bu to \$5.00/bu, alfalfa hay was varied from \$80 to \$160/ton and corn silage and grass hay were varied proportionately with grain and alfalfa. The expected returns from feeding cull cows are displayed in Table 5.

In analyzing the results of this sensitivity analysis, it is obvious, the higher the cost of the feed stuffs the lower the expected return to the cull cow feeding program. Not so intuitive is the finding that returns to feeding cull cows increase with higher cull cow prices. The reason this happens is that the seasonal price indices and the price differentials between grades are based on percentages. Therefore, if cull cow prices increase by 10 percent, there will be a greater price and revenue increase based on a \$50/cwt cull cow prices compared to a \$35/cwt cull cow price.

## Summary

Cull cow receipts are a valuable source of income to most cow-calf enterprises. In this paper, the seasonality of cull cow prices was discussed and the price differentials between cull cow grades were reported. By timing cull cow sales to take advantage of seasonally higher prices, and by feeding thin cull cows to improve their slaughter grade, revenue from cull cows can be increased significantly.

Feed costs vary from year-to-year, mostly depending upon the price of feeds. They also vary within each year, depending upon the feeding program.

The profit potential of various cull cow feeding and marketing alternatives can be properly evaluated through the use of a partial budget. Costs and revenue will be different each year. However, the partial budget analysis will help to evaluate the most profitable marketing decision. Remember, when arriving at expected prices, you should consider both seasonal price changes and potential for grade changes. All costs, and not just feeding costs, should be considered on the cost side of the budget.

An online web based decision tool has been developed to help you evaluate your own situation with regards to cull-cow feeding. It is based on the relationships discussed in this fact sheet. You can access the tool at the follow url:

<http://cattlemarketanalysis.org/cullCowculator.html>

Table 5. Expected Returns to Feeding Lean Market Cull Cows from November to February on a Hay, Silage, or Grain Ration with varying Feed and Cull Cow Prices (dollars/head).

Nov Cull Cow Price	alfalfa 80 grass 68 corn 3 silage 27	alfalfa 80 grass 68 corn 4 silage 36	alfalfa 80 grass 68 corn 5 silage 45	alfalfa 120 grass 102 corn 3 silage 27	alfalfa 120 grass 102 corn 4 silage 36	alfalfa 120 grass 102 corn 5 silage 45	alfalfa 160 grass 136 corn 3 silage 27	alfalfa 160 grass 136 corn 4 silage 36	alfalfa 160 grass 136 corn 5 silage 45
\$35	19 59 65	19 44 23	19 29 -19	-22 37 53	-22 22 11	-22 7 -31	-63 15 42	-63 0 -1	-63 -15 -43
\$40	38 85 101	38 70 58	38 54 16	-3 63 89	-3 48 47	-3 33 4	-45 41 77	-45 26 35	-45 11 -8
\$45	57 110 136	57 95 94	57 80 51	16 89 124	16 73 82	16 58 40	-25 67 112	-25 52 70	-25 37 28
\$50	76 136 171	76 121 129	76 106 87	35 114 159	35 99 117	35 84 75	-6 93 148	-6 77 105	-6 62 63

Note: The top value in each cell is the Hay Ration return, the middle value is the Silage Ration return, and the bottom value is the Grain Ration return. Hay and silage prices are in \$/ton, corn price is in \$/bu, and cow prices are in \$/cwt.

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