

MARKETING CULL COWS - HOW & WHEN?

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INTRODUCTION

Cull cows are often overlooked as an important 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 15-30 percent of income 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 culling takes place, and 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 and that is the purpose of this paper and presentation.

Cows are culled from a herd for a number of reasons and the reason for culling will most likely affect the time culling takes place and could alter the most profitable marketing strategy. Reproductive failure, problems resulting from old age, and unsatisfactory performance are the most common reasons for culling an animal. While reproductive failure is generally diagnosed in the fall of the year, culling for other reasons could take place at other times.

Three factors of importance regarding the decision to sell cows when culled versus feeding them and selling at a latter time are: (1) the seasonality of cull cow prices, (2) the price difference between cull cow slaughter grades and the percentage of cull cows in each grade, and (3) the 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 are normally the lowest in November, December and January and are at their highest level in March April and May. Prices during the summer months are typically near the average for the year. If overall cattle prices are rising sharply or declining sharply in a year, then this price pattern may not be as apparent. However, by analyzing prices over a number of years the seasonal price patterns can be determined. Since cull cow prices in one year may be around \$30/cwt. and in another year may be close to \$50/cwt., it is somewhat difficult to evaluate prices over a number of years. However by expressing monthly prices as a percent of the annual average price a monthly index value is created:

$$\text{Monthly Index} = \frac{\text{Monthly Price}}{\text{Annual Average Price}} * 100.$$

By analyzing these monthly index values over a number of years, a seasonal price pattern can be identified. Figure 1 contains a graph of the seasonal price pattern at Sioux Falls, South Dakota for 1985-1994 for cutter grade cows. Prices are typically lowest in November when they are 7% below the annual average price. In March the price is typically 4.5% above the annual average price. Prices at many other locations, such as, Omaha, Nebraska and Billings, Montana have very similar seasonal patterns.

By simply considering this seasonal pattern, it may be profitable to feed cows that are culled in the late fall or early winter into the spring months to take advantage of the seasonal prices. On the other hand, cows that are culled during calving season or early summer may be most profitable if sold at the time of culling. However, the other two factors (cull cow grades and feed costs) still need to be considered.

COW SLAUGHTER GRADES

The prices for cull cows are based on their USDA carcass grade or their expected carcass

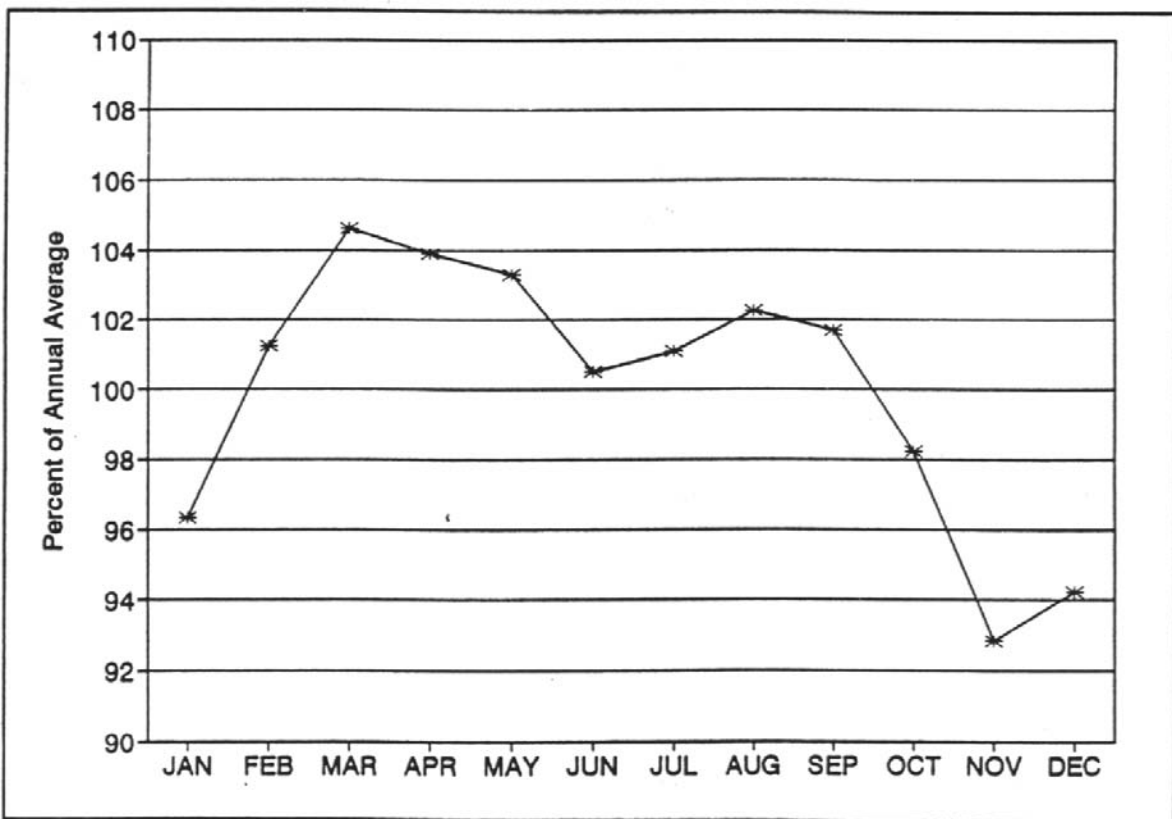


Figure 1. Seasonal Cull Cow Prices at Sioux Falls, South Dakota, Cutter Grade, 1985-1994.

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. Younger aged cows

(heiferettes of 30 months or less) may also reach the Standard, Select or Choice grade. The price difference between these grades impacts 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 with the differential widening in higher priced years and widening in the fourth quarter of the year. The average price differentials between grades at Sioux Falls from 1985 - 1994 are displayed in Table 1. These differences also are consistent with those at the Omaha and Billings markets.

Table 1. Percentage Price Increases Between Cull Cow Grades at Sioux Falls, 1985-94.

	Cutter	Utility	Commercial
Canner	10%	18%	24%
Cutter		8%	14%
Utility			6%

Source: Computed from Feuz.

In a 1993 study at South Dakota State University (Pritchard and Burg) cull cows were purchased in November and December from area sale barns. The cows were sent to slaughter after 0, 50, 77, and 105 days on feed. The cows were fed a high concentrate ration containing 75 percent corn grain and 15 percent corn silage on a dry matter basis. The cows gained 2.8, 3.0, and 3.1 pounds per day for each of the respective feeding periods. Table 2 contains the percentage of cull cows that were in each grade at slaughter.

In the trial at South Dakota State, initial condition of the cows did not affect the rate of gain, but it did have an effect on the degree of marbling. From this trial it would appear that most cull cows could be expected to improve one grade following a 60-100 day high concentrate feeding program, and that many could improve two grades.

Cull cows that are fed on primarily a roughage diet would not obtain the same rates of gain, nor grade changes. A ration of alfalfa-grass hay should produce about 1.5 pounds per day gain over a 60-90 day feeding period, assuming the cows were fairly thin at the start of the feeding period (Wagner). It is unlikely that the cows would improve more than one slaughter grade on this feeding program.

Table 2. Percentage of Cows in Each Grade Following a Feeding Program of Shelled Corn and Corn Silage.

Days Fed	USDA Slaughter Grade					
	Canner	Cutter	Utility	Commercial	Standard	Choice
0	64	29	7			
50	18	57	24		1	
77	8	21	65	4	1	1
105	0	19	74	6	1	

Source: Adapted from Pritchard and Burg.

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 any 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 \$0.20 per day is often used to cover the yardage charge. 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 \$350 and if you are paying 10% interest and you plan on feeding the cow for 90 days, the interest charge would be \$8.63 per head [$\$350 \times .10 \times (90/365) = \8.63].

The charge for death loss would be the percent of death loss times the expected sale value. For example, if one percent death loss is assumed and the sale price is expected to be \$425, then the cost of death loss is \$4.25 per head [$\$425 \times .01 = \4.25].

PARTIAL BUDGET ANALYSIS

The proper manner to consider all of these factors is to construct a partial budget and evaluate if it would be profitable to feed the cull cow rather than selling when culling takes place. The partial budget will have three main section: (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.

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

Tables 3 & 4 contain **example** partial budgets based on cull cow prices and feed costs typical of 1995. Table 3 is representative of a high concentrate feeding program and Table 4 is typical of a roughage program.

For Table 3, a canner grade cull cow weighing 1,000 pounds could be sold in November for \$28.90 per cwt. Based on the seasonal relationship in Figure 1, the price in late February should be about 10% higher for the same grade, or \$31.79 (\$28.90 x 1.10 = \$31.79). If most of the cows improve to the cutter and utility grade, then that price should be about 15% higher, or \$35.60 (\$31.79 x 1.15 = \$35.60). The weight gain was projected at 3.00 pounds per day for 100 days.

The price of corn grain was estimated at \$2.80 per bushel, corn silage was priced at \$25/ton, and supplement was priced at \$200/ton. Dry matter intake was estimated at 28 lbs/day. The calculated feed costs are \$0.52 per pound of gain and the total feeding costs are \$0.62 per pound of gain. Subtracting the total additional costs and the lost revenue from not selling the cull cow in November from the expected revenue in February results in an expected loss from feeding of \$11 per head.

The same fall cull cow price scenario is used in Table 4, but rather than a high concentrate ration a roughage ration is assumed. In this case the cows are fed an alfalfa-grass hay ration for 84 days. Based on the seasonal relationship in Figure 1, the price in early February should be about 8% higher for the same grade, or \$31.21 (\$28.90 x 1.08 = \$31.21). If about ½ of the cows improve one grade, then that price should be about 4.5% higher, or \$32.60 (\$31.21 x 1.045 = \$32.60). The weight gain was projected at 1.50 pounds per day for 84 days.

Feed costs are estimated to be \$0.42 per pound of gain based on the price of hay at \$47/ton and assuming that the cows will eat 2.5 percent of their body weight. The total cost of gain in this program is also \$0.62 per pound of gain. The labor, yardage, interest, and other costs are spread over fewer pounds of gain, so that they are a greater share of the total costs with this feeding program. Subtracting the total additional costs and the lost revenue from not selling the cull cow in November from the expected revenue in February results in an expected break-even situation from feeding the cows on the roughage program.

The return on investment in the cull cow for the duration of the feeding period can be calculated by

$$\text{Return on Investment} = \frac{\text{Net Rev} + \text{Int Cost} - \text{Labor \& Mgmt}}{\text{Initial Cull Cow Value}} * (365/\text{Days Fed}) * 100$$

Table 3. A Partial Budget for a Canner Grade Cull Cow in November Fed for 100 Days on a High Concentrate Ration and Slaughtered in Late February.

		Per head
Additional Revenue	1300 lbs X \$35.60/cwt	\$463
Less		
Lost Revenue	1000 lbs X \$28.90/cwt	<u>\$289</u>
Feeding Margin		\$174
Less		
Additional Costs		
Feed		\$155
Yardage		20
Interest (\$289*.10*100/365)		8
Death Loss \$463*.005		<u>2</u>
Total		<u>\$185</u>
Net Revenue		<u><u>-11</u></u>

Feed Costs per Pound of Gain
 $\$155/300 \text{ lbs} = \0.52

Total Costs per Pound of Gain
 $\$185/300 \text{ lbs} = \0.62

Return on Investment

$$\frac{\$-11 + \$8 - \$35}{\$289} * (365/100) * 100 = -48.0\%^a$$

Break-even Selling Price

$$\frac{\$289 + \$187}{1300 \text{ lbs}} * 100 = \$36.62/cwt$$

^a Labor is \$26.25/cow (3.5 hours/cow * \$7.50/hr) and management is five percent of the feeding margin (\$176 * .05 = \$8.70/cow). So the total charge for operator labor and management is about \$35/cow.

Table 4. A Partial Budget for a Canner Grade Cull Cow in November Fed for 84 Days on a Roughage Ration and Sold in Early February.

		Per head
Additional Revenue	1125 lbs X \$32.60/cwt	\$367
Less		
Lost Revenue	1000 lbs X \$28.90/cwt	<u>\$289</u>
Feeding Margin		\$ 78
Less		
Additional Costs		
Feed		\$52
Yardage		17
Interest (\$289*.10*100/365)		7
Death Loss \$463*.005		<u>2</u>
Total		<u>\$ 78</u>
Net Revenue		<u><u>0</u></u>

Feed Costs per Pound of Gain
\$52/125 lbs = \$0.42

Total Costs per Pound of Gain
\$78/125 lbs = \$0.62

Return on Investment

$$\frac{\$0 + \$7 - \$26}{\$289} * (365/84) * 100 = -28.6\%^a$$

Break-even Selling Price

$$\frac{\$289 + \$78}{1125 \text{ lbs}} * 100 = \$32.62/cwt$$

^a Labor is \$22.50/cow (3.0 hours/cow * \$7.50/hr) and management is five percent of the feeding margin (\$78 * .05 = \$3.90/cow). So the total charge for operator labor and management is about \$26/cow.

Interest is added back into the net revenue and a charge for operator labor and management is subtracted when calculating return on investment. In these two examples, the return on investment is negative for the cow feeding programs.

The break-even selling price is often calculated to determine the risk involved in the feeding program. If the break-even selling price is considerably below your expected selling price, the program would be less risky than if the break-even selling price was at or above your expected selling price. The break-even selling price is calculated by

$$\text{Break-even Selling Price (\$/cwt)} = \frac{\text{Lost Revenue} + \text{Total Additional Costs}}{\text{Final Weight}} * 100$$

For these examples the break-even selling prices are at or above the expected selling prices. With high grain prices and relatively lower cull cow prices, feeding cull cows may not be profitable.

SENSITIVITY ANALYSIS

This is only an example of two feeding programs based on this year's cow prices and feed costs. How sensitive to feed costs and cull cow prices are the returns to cull cow feeding? Cull cow prices were varied from \$30/cwt. to \$45/cwt. for the price of a Canner grade cull cow in September and October, November prices would be lower.

In Table 5, the price of corn grain was varied from \$2.00/bu to \$3.00/bu, and corn silage and concentrate prices were adjusted relative to corn prices. The expected return from feeding cull cows on a high concentrate ration are displayed with the most profitable number of days on feed, in 14 day increments. The price of alfalfa/grass hay was varied from \$40/ton to \$80/ton in Table 6 and the expected profit from feeding a thin, Canner or low Cutter grade, cow for 98 days on a roughage ration is displayed.

There are several observations that can be made from analyzing the results of this sensitivity analysis. Obviously, the higher the cost of the feed stuffs for a particular ration, 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 pattern and the price differentials between grades remain relatively similar in periods of low and high cull cow prices. Therefore, if cull cow prices increase by 10 percent, there will be a greater price and revenue increase based on a \$40/cwt cull cow prices compared to a \$30/cwt cull cow price. The final observation is that in most cases, returns from the high concentrate feeding program will exceed returns from the roughage feeding program. The exception to that is in periods of relatively low cull cow prices when corn is relatively high priced compared to hay. In that case, the roughage ration provides higher expected returns.

Table 5. Expected Returns (\$/head) and Optimal Days on Feed from Feeding Cull Cows on a High Concentrate Ration with Varying Feed Costs and Cull Cow Prices.

	September-October Canner Grade Cull Cow Prices			
Corn Price	\$30/cwt	\$35/cwt	\$40/cwt	\$45/cwt
\$3.00/bu	-\$15 84 days	\$10 98 days	\$38 112 days	\$69 112 days
\$2.75/bu	-\$7 84 days	\$20 98 days	\$50 112 days	\$81 112 days
\$2.50/bu	\$8 98 days	\$36 112 days	\$67 112 days	\$98 112 days
\$2.25/bu	\$18 98 days	\$49 112 days	\$79 112 days	\$110 112 days
\$2.00/bu	\$35 112 days	\$66 112 days	\$96 112 days	\$128 126 days

Table 6. Expected Returns (\$/head) from Feeding Thin Cull Cows on a Roughage Ration for 98 days with Varying Feed Costs and Cull Cow Prices.

	September-October Canner Grade Cull Cow Prices			
Hay Price	\$30/cwt	\$35/cwt	\$40/cwt	\$45/cwt
\$80/ton			-\$13	\$0
\$70/ton		-\$15	\$0	\$13
\$60/ton	-\$15	-\$1	\$13	\$27
\$50/ton	-\$2	\$12	\$26	\$40
\$40/ton	\$11	\$25	\$39	\$53

SUMMARY

Cull cow receipts are a valuable source of income to most cow-calf enterprises. In periods of relatively low cattle prices, properly managing and marketing cull cows may mean the difference between a profit and a loss for the year. In this paper, the seasonality of cull cow prices were 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 significantly increased. Feed costs vary from year-to-year depending upon the price of feeds and 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. Based on expected cull cow prices and feed costs, the partial budget examples in this paper do not appear profitable.

Your costs and revenue will likely be different. However, the partial budget analysis will help you to evaluate the most profitable marketing/management decision for your cull cows. Remember when arriving at your expected prices to 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.

The feeding programs discussed in this paper are not the only available alternatives. Evaluate your feed resources and analyze programs that may work for you. Your financial future in the cow-calf industry will be somewhat dependent upon the income you can generate from cull cows.

REFERENCES

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