



Adding Value to Cull Cows

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Introduction

Extension fact sheet AGEC-613, *Cull Cow Grazing and Marketing Opportunities* (Peel and Doye 2008), discusses several factors affecting the value of cull cows. Among those factors were quality grades for cow carcasses, categories for reporting cull cows prices, cull cow quality factors related to body condition scores (BCS) and seasonality in cow prices. Cowherd owners may be able to add value to their cull cows by retaining them beyond the usual market time. This Extension fact sheet reports costs and returns for two alternative management systems and six alternative marketing times based on an experiment conducted in conjunction with the Samuel Roberts Noble Foundation in Ardmore, Okla. (Amadou 2009).

Cull Cow Management Systems

Although cull cows represent 15 percent to 30 percent of a cow-calf herd's revenue, relatively little attention is given to cull cow marketing. Most cow-calf producers traditionally sort and sell cull cows in the fall when prices are at or near the seasonal low. However, alternative management systems and timing of cull cow marketing may increase net revenues for the cow-calf operation.

Selection of cull cows to retain in some type of management program is extremely important. Cull cows that are unsound, injured or simply unhealthy should be sold upon culling. The most desirable type cull cow for feeding is a healthy cow in thin-to-moderate condition or has a BCS of 3 to 5. These cattle likely have the ability to gain a substantial amount of weight over the feeding period.

The experiment conducted at the Noble Foundation involved two management systems for 48 cull cows from their spring-calving herds. One management system involved feeding 24 cull cows on grain and supplement in dry lot confinement. The second management system was feeding 24 cull cows on forages. The experiment was conducted from October 2007 to April 2008. Selected data were collected at five intervals including the initial culling date, October 3. Time periods after culling were 42 days (November 15), 78 days (January 10), 111 days (February 12), 134 days (March

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6) and 164 days (April 2). Data were collected on weight, estimated USDA grade, estimated dressing percentage, costs (feed, animal health, etc.) and estimated market value.

For each time interval and each cumulative period, estimated animal performance and net returns were calculated. Estimated USDA grade and dressing percentage were used to assign a price to each cow, based on prices reported by the Agricultural Marketing Service (AMS) for cull cows in Oklahoma sold the same week. The market value of each cow at each period was calculated. Data enabled tracking animal performance, costs—and estimated value—all of which are critical to assessing the added costs and returns for retaining cows beyond the normal culling date.

Experiment Results

Table 1 summarizes several key variables for the experiment at culling and at cumulative feeding intervals. Selected data in Table 1 are also presented in figures and discussed below.

Growth

Cows began the experiment in good body condition. BCSs were 5 to 7 for most cows. Thus, cows did not gain as much weight as if they were in thin-to-moderate condition (BCS of 3 to 5). Figure 1 shows that cows in dry lot gained more weight on average than cows on grass. Cows in dry lot lost weight between days 78 and 111 (January and February) but generally gained weight each feeding interval. Cows on grass actually gained weight only in the first 42 days (October to November), then lost weight thereafter. However, even at 164 days (April), the average weight of cows on grass was greater than their weight at culling.

Figure 2 shows the average daily weight gain for both groups of cows for feeding intervals. Average daily gain (ADG) declined generally for each group of cows. ADG was higher for cows in dry lot after 42 days (November) and remained higher for each cumulative feeding interval. For both management systems, the decline in ADG indicated weight gain was slowing or cows were losing weight as the length of the feeding period increased.

Costs

Average cost of gain is shown in Figure 3. Average cost of gain was lower for cows on grass compared with cows in dry lot. Cows in dry lot gained faster but ration costs were much higher, thereby contributing to the higher cost per pound of gain. Feed costs accounted for 83 percent to 93 percent of total costs for each feeding interval. Percentages were higher for cows in dry lot than cows on grass.

Table 1. Summary statistics on key physical and economic attributes of cull cows from October 2007 to April 2008.

Time Period	Attribute	Grass			Dry lot		
		Mean	Min	Max	Mean	Min	Max
At culling (October 3)	<i>Beginning weight(lbs/head)</i>	1,260.75	1,048.00	1,608.00	1,269.04	1,034.00	1,644.00
	<i>Beginning dressing percent(%/head)</i>	49.21	46.00	54.00	50.42	48.00	53.00
	<i>Beginning price(\$/ cwt)</i>	45.05	43.06	47.76	46.63	44.12	48.94
0-42 Days (November 15)	<i>Total gain(lbs)</i>	92.79	42.00	174.00	98.25	-34.00	337.00
	<i>Average daily gain(lbs/day/head)</i>	2.21	1.00	4.14	2.34	-0.81	8.02
	<i>Total costs(\$/head)</i>	20.77	20.77	20.77	27.46	27.46	27.46
	<i>Cost per pound of gain(\$/lb/head)</i>	0.26	0.12	0.49	0.85	-0.81	13.73
	<i>Ending price(\$)</i>	39.63	37.42	41.73	41.16	38.34	44.12
	<i>Net Margin(\$)</i>	-52.32	-82.7	4.27	-56.42	-125.58	68.70
0-78 days (January 10)	<i>Total gain(lbs)</i>	81.33	-19.00	169.00	160.54	21.00	412.00
	<i>Average daily gain(lbs/day/head)</i>	1.04	-0.24	2.17	2.06	0.27	5.28
	<i>Total costs(\$)</i>	39.32	39.32	39.32	122.75	122.75	122.75
	<i>Cost per pound of gain(\$/lb/head)</i>	0.69	-2.07	3.93	1.12	0.30	5.85
	<i>Ending Price(\$)</i>	43.63	40.88	47.04	45.75	41.06	48.85
	<i>Net Margin(\$)</i>	-21.76	-39.55	35.66	-60.41	-62.35	105.73
0-111 days (February 12)	<i>Total gain(lbs)</i>	68.00	-38.00	154.00	157.63	-150.00	402.00
	<i>Average daily gain(lbs/day/head)</i>	0.61	-0.34	1.39	1.42	-1.35	3.62
	<i>Total costs(\$)</i>	58.21	58.21	58.21	212.18	212.17	212.18
	<i>Cost per pound of gain(\$/lb/head)</i>	-0.18	-19.40	3.88	1.93	-1.41	12.48
	<i>Ending price(\$)</i>	49.25	46.14	53.65	51.56	46.42	55.43
	<i>Net Margin(\$)</i>	28.16	6.15	109.47	-68.28	-152.3	157.45
0-134 days (March 6)	<i>Total gain(lbs)</i>	44.25	-68.00	149.00	202.42	61.00	447.00
	<i>Average daily gain(lbs/day/head)</i>	0.33	-0.51	1.11	1.51	0.46	3.34
	<i>Total costs(\$)</i>	77.10	77.10	77.10	282.08	282.08	282.08
	<i>Cost per pound of gain(\$/lb/head)</i>	0.50	-15.42	11.01	1.70	0.63	4.62
	<i>Ending price(\$)</i>	49.57	37.98	54.00	51.49	46.35	55.36
	<i>Net Margin(\$)</i>	1.77	15.52	112.28	-116.13	-38.74	162.08
0-164 days (April 2)	<i>Weight(lbs)</i>	1,314.17	1,075.00	1,535.00	1,471.46	1,200.00	1,705.00
	<i>Dressing percent</i>	49.10	45.50	54.00	50.98	48.00	54.00
	<i>Total gain(lbs)</i>	53.42	-88.00	161.00	202.42	61.00	447.00
	<i>Average daily gain(lbs/day/head)</i>	0.33	-0.54	0.98	1.23	0.37	2.73
	<i>Total costs(\$)</i>	99.07	99.07	99.07	352.61	352.61	352.61
	<i>Cost per pound of gain(\$/lb/head)</i>	1.70	-7.08	19.81	2.12	0.79	5.78
	<i>Ending price(\$)</i>	49.23	47.14	51.80	51.47	48.94	56.28
	<i>Net Margin(\$)</i>	-29.86	-40.47	108.09	-186.98	-101.5	83.71

Value Change

Net margins from feeding cows beyond the typical culling date is affected by both components of the profit equation – revenue and costs. Figures 1 through 3 address the physical growth of cows during the experimental period and the costs associated with weight gain for two management methods.

Value or revenue is influenced in part by weight gain and also in part by dressing percentage changes as cows are fed longer. More important, however, are market prices for cows at various points in time. Dressing percentages in table 1 show that estimated dressing percentage of cows in the experiment changed relatively little throughout the feeding period. This was due in part to the good condition and relatively high BCS of cows culled. What this means in terms of value is that little gain was found for improving the carcass grade of cows in the experiment.

Figure 4 shows the most important contributor to value changes over time, which is prices paid for cows at each weigh point. Cows were culled in mid-October when seasonal prices were relatively low. However, price dropped between the culling date and day 42 (October to November). That price decline was in line with the typical seasonal pattern.

From the seasonal low, prices increased as is seasonally typical at days 78 (January) and 111 (February), then leveled. Oftentimes, slaughter cow prices continue to increase during the March-April period but that continued price increase did not occur in 2008.

Net Margins

Most important to the decision of whether to market cows at culling or hold them in some type of feeding program for a period of time is what happens to net margins. Does the added value from holding cows offset the added cost associated with feeding and caring for cows during the chosen feeding period? Figure 5 shows the average net returns (revenue minus costs) for each feeding interval and each management system.

For all intervals, net returns were greater for cows on grass than cows in dry lot. The previously discussed variables help explain what is shown in Figure 5. Cows gained in value during the first 42 days (October to November) from added weight but declined in value over that 42-day period from the drop in prices. After the first interval, price increases offset losses in value from weight loss for cows on grass. Cows in dry lot increased in value both from additional weight gain

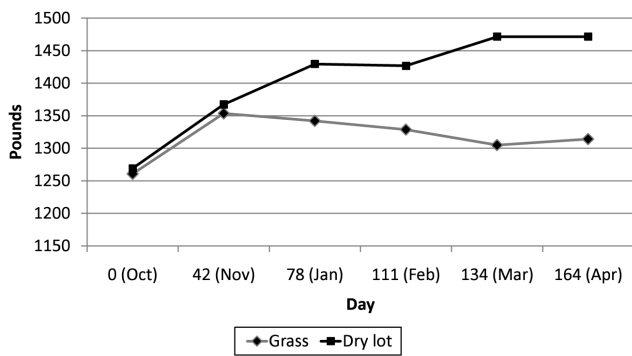


Figure 1. Weight of cows at each weigh date for two production systems.

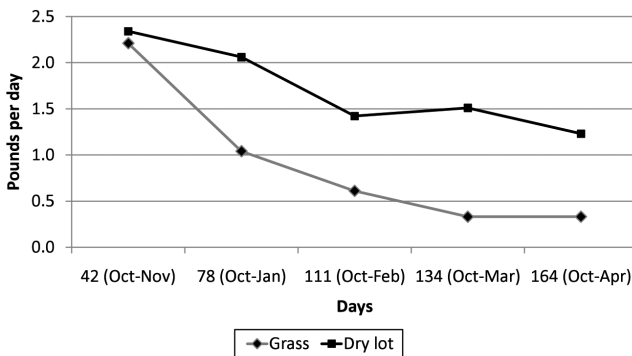


Figure 2. Average daily gain (ADG) of cows at each cumulative interval for two production systems.

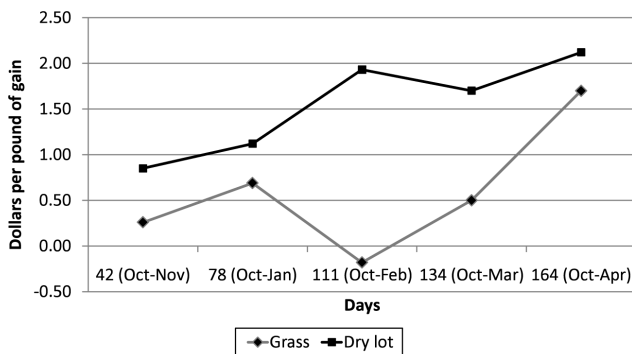


Figure 3. Average cost of gain for cows at each cumulative interval for two production systems.

and increase in prices. However, Figure 5 shows net returns for cows in dry lot declined due to the higher feed costs associated with getting the weight gain. Those higher costs for cows in dry lot are shown in Figure 3.

Cows on grass lost weight after the first 42 days (October to November), reducing their value. However, their ration costs were low so even at lower weights, their value increased due to higher prices. The higher prices and lower costs compensated for the loss in weight.

Figure 5 indicates that only at 111 days (February) and 134 days (March) were net returns positive for either feeding program for this first year of a three year experimental design. In this first year, the best alternative would be to keep cows on grass and market them at 111 days (February).

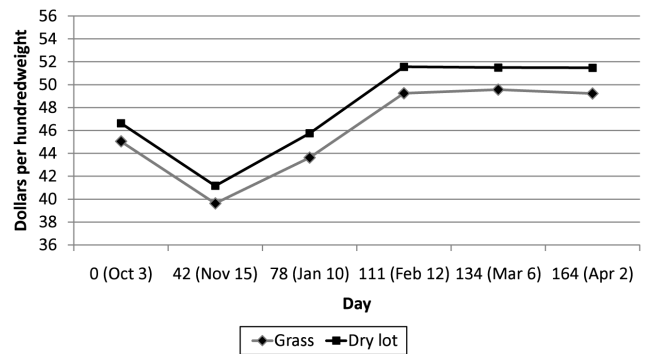


Figure 4. Average price for cows at each weigh date for two production systems.

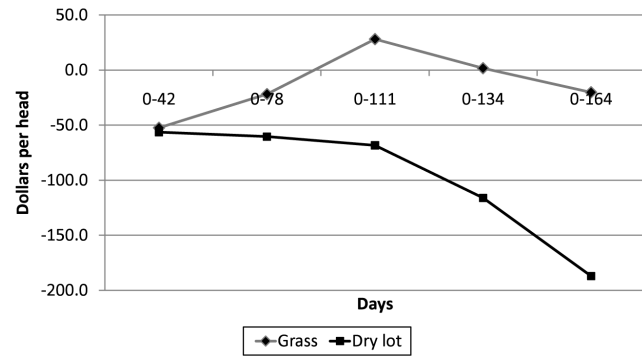


Figure 5. Average net returns for cows at each cumulative interval for two production systems.

Partial Budget Comparison

Producers are encouraged to insert realistic numbers reflecting their specific ranch situation into a partial budget when considering holding cows beyond the culling date (Ward, Raper and Peel 2008). Table 2 shows an OSU partial budget from the *Beef Cattle Manual* (Lalman and Doye 2008) compared with partial budgets for the first three periods of the cow feeding experiment. The partial budgets from the experiment use actual experimental results where applicable (physical performance, costs and prices) and common assumptions from the OSU budget where necessary. Note: the OSU budget is for a 90-day feeding period, which falls between day 78 (January 10) and day 111 (February 12) of the experiment.

Projected net returns in the OSU budget were more optimistic than experienced in the experiment for 2007-08. The projected net return at 90 days was \$30.12/head compared with an actual return for the cows on grass at 111 days (February) at \$19.99/head. Two reasons can explain most of the difference in expected versus actual returns. The 90-day price change in the OSU budget was greater than what occurred in 2007-08. The budget also assumed a \$1.50/cwt increase due to change in carcass grade. As noted earlier, no significant increase in grade occurred in the experiment because cows were culled in good condition with relatively high BCS. Costs in the OSU budget were higher than for cows on grass but lower than cows in dry lot. Costs will vary across producers depending on the forage and feed resources available and will vary across years as forage and feed prices change.

The budgeted versus actual comparison emphasizes the importance of knowing expected gains for cows, expected changes if any in carcass grade, and ration costs. However, the key to net returns is the seasonal increase in slaughter cow prices during the feeding period.

Table 2. Cull cow partial budgets.

	OSU Budget*	Grass			Dry lot		
		0-42 days Oct-Nov	0-78 days Oct-Jan	0-111 days Oct-Feb	0-42 days Oct-Nov	0-78 days Oct-Jan	0-111 days Oct-Feb
Traditional management							
Cull cow (marketing) weight (lbs.)	1,100	1,260.75	1,260.75	1,260.75	1,269.04	1,269.04	1,269.04
Shrink (%)	6.0	6	6	6	6	6	6
Sale weight (lbs.)	1,034	1,185	1,185	1,185	1,193	1,193	1,193
Price (\$/cwt.)	45.00	45.06	45.06	45.06	46.63	46.63	46.63
Gross revenue (\$/head)	465.30	533.97	533.97	533.97	556.23	556.23	556.23
Cow feeding revenue							
Beginning cull cow weight (lbs.)	1,100	1,260.75	1,260.75	1,260.75	1,269.04	1,269.04	1,269.04
Days on feed	90	42	78	111	42	78	111
ADG (lbs./day)	1.0	2.21	1.04	0.61	2.34	2.06	1.42
Fed cow (marketing) weight (lbs.)	1,190	1,354	1,342	1,328	1,367	1,430	1,427
Shrink (%)	4.0	4	4	4	4	4	4
Sale weight (lbs.)	1,142	1,299	1,288	1,275	1,313	1,373	1,370
Cull cow price from traditional management (\$/cwt.)	45.00	45.06	45.06	45.06	46.63	46.63	46.63
Price change from cull date to marketing date (\$/cwt.)	5.00	0	0	0	0	0	0
Price premium for increased BCS/quality grade (\$/cwt.)	1.50	0	0	0	0	0	0
Final price (\$/cwt.)	51.50	39.63	43.63	49.25	41.11	45.75	51.56
Gross revenue (\$/head)	588.34	515.01	562.10	628.10	539.59	627.96	706.18
Cow feeding costs							
Interest rate (%)	7.0	7	7	7	7	7	7
Cattle interest (\$/head)	8.03	4.30	7.99	11.37	4.48	8.32	11.84
Health supplies and medicine (\$/head)	2.00	2	2	2	2	2	2
Death loss (%)	1.00	0	0	0	0	0	0
Death loss (\$/head)	5.88	0	0	0	0	0	0
Labor and equipment (\$/head)	4.00	1.78	4.61	7.97	3.11	4.56	12.00
Feed, hay, and pasture (\$/head)	70.00	18.82	34.40	49.80	24.12	102.26	186.75
Additional marketing costs (tags, commission, etc.) (\$/head)	3.00	3	3	3	3	3	1
Total cost (\$/head)	92.91	29.90	51.99	74.13	36.71	120.14	213.59
Traditional vs Cow feeding Summary (\$/head)							
Traditional gross revenue	465.30	533.97	533.97	533.97	556.23	556.23	556.23
Cow feeding gross revenue	588.34	515.01	562.10	628.10	539.59	627.96	706.18
Increased revenue	123.04	-18.96	28.13	94.13	-16.64	71.73	149.96
Less retained ownership costs	92.91	29.90	51.99	74.13	36.71	120.14	213.59
Net return from cow feeding	30.12	-48.86	-23.86	19.99	-53.35	-48.40	-63.64

* Beef Cattle Manual, 6th ed., 2008

Summary and Conclusion

An experiment in conjunction with the Noble Foundation was conducted to determine the economics of holding cows after culling in one of two management programs – a dry lot feeding program or a grass forage program. Useful information was gained on cow performance and feeding costs over the feeding period. Results suggest a potential for holding cows beyond culling for about 3 months on a low-cost feeding program. However, results indicate the key to net returns in this first year of the experiment was experiencing the typical seasonal price increase from the low in November through the January-February period.

References

- Amadou, Zakou. *Management Production Systems and Timing Strategies for Cull Cows*. Unpublished Master of Science thesis, Oklahoma State University, May 2009.
- Lalman, David and Damona Doye (ed.). *Beef Cattle Manual*, 6th ed., Oklahoma Cooperative Extension Service, E-913, 2008.
- Peel, Derrell and Damona Doye. *Cull Cow Grazing and Marketing Opportunities*. Oklahoma Cooperative Extension Service, Extension fact sheet AGEC-613, May 2008.
- Ward, Clement; Kellie Raper; and Derrell Peel. *Value-Added Marketing Opportunities*. *Beef Cattle Manual*, 6th ed., Oklahoma Cooperative Extension Service, E-913, 2008.

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