



Adding Value to Cull Cows: Part II

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Introduction

Previous Oklahoma State University fact sheets have addressed the importance of cull cow marketing, including Peel and Doye (2008) and Amadou et al. (2009). Peel and Doye (2008) discuss how cowherd owners may add value to cows culled from the herd by holding them beyond the traditional fall marketing period with the possibility of increasing quality grades and taking advantage of seasonality in cow prices. Amadou et al. (2009) also discusses how alternative management systems and timing of cull cow marketing has the potential to increase net revenues for cow-calf operations. Results from their 2007-2008 experiment indicated that holding cull cows on grass beyond culling for about 111 days (February) was profitable, while feeding cows in a dry lot scenario was not profitable for any of the marketing dates considered. In addition, Amadou et al.'s results indicate that the net returns from that experiment were strongly influenced by the seasonal price increase from the low in November through late winter/early spring. Ward et al. (2008) encourage producers to carefully analyze a partial budget scenario based on their ranch situation before deciding to hold cull cows beyond the culling date.

This fact sheet presents results from the second year of a cull cow marketing experiment conducted at the Samuel Roberts Noble Foundation in Ardmore, Okla. The study is a continuation of the study in Amadou et al. (2009) and describes costs and returns for two alternative management systems and six alternative marketing times for cull cows. Results from year one and year two also are briefly compared.

Alternative Cull Cow Management Systems

The second year of the cull cow marketing experiment at the Samuel Roberts Noble Foundation was conducted from

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October 9, 2008 to March 13, 2009. As in the first year, cull cows were divided between a dry lot system and a forage system. In the dry lot system, 22 cows were fed on grain and supplement. In the forage system, 21 cows were fed hay and other stockpiled forages. Data were collected at culling (Oct. 9, 2008) and at five intervals, including 35 days (Nov. 13), 70 days (Dec. 18), 98 days (Jan. 15), 133 days (Feb. 19) and 155 days (March 13). Similar to the 2007-2008 experiment, data were collected on weight, estimated USDA grade, dressing percentage, costs (feed, animal health, etc.) and estimated market value.

Estimated animal performance measures and net returns were computed for each time interval and for each cumulative time period. Estimated USDA grade and dressing percentage were used to assign a price to each cow based on prices reported by the Agricultural Marketing Services (AMS) for cull cows in Oklahoma sold during the same period. The market value of each cow at each period was calculated using this information.

Experiment Results

Table 1 summarizes several key variables for the experiment at culling and at cumulative feeding periods. Additional figures based on data in Table 1 also are presented and discussed below.

Growth

The majority of the cows began the experiment in good condition, relative to what a typical producer might cull from a cowherd. Most cows began with body condition scores (BCS) from 5 to 7, suggesting that cows in the experiment likely gained less weight than cows of lower body condition scores (3 to 5) might have gained. Figure 1 shows that cows on forage hit their peak weight at 35 days (Nov. 13) and then slowly lost weight over the experimental period. In fact, the average weight of cows on forage at 155 days (March 13) was lower than their average weight at culling (Oct. 9). In contrast, cows in the drylot gained throughout most of the study and attained peak weight at 133 days (Feb. 13). Table 1 shows that average daily gain (ADG) generally decreased over time for each group of cows. ADG at 35 days and at 155 days for cows on forage was higher than for cows on feed, but in general, cows held in the drylot had higher ADGs than cows on forage.

Table 1. Summary statistics on key physical and economic attributes of cull cows from October 2008 to March 2009.

Time period	Attributes	Drylot			Pasture		
		Mean	Min	Max	Mean	Min	Max
At Culling (October 9)	<i>Beginning weight (lbs/head)</i>	1,350	1,125	1,685	1,347.86	1,115	1,670
	<i>Beginning dressing percent (% of live weight)</i>	50.36	46	55	49.67	46.5	56
	<i>Beginning dressing price (\$/cwt)</i>	46.92	42	52.5	45.73	42.72	51.92
	<i>Beginning revenue (\$)</i>	651.72	472.5	884.63	616.17	496.18	951.9
0-35 days (November 13)	<i>Weight (lbs)</i>	1,410.23	1,180	1,770	1,426.67	1,230	1,765
	<i>Total gain since culling (lbs)</i>	60.23	-10	100	78.81	-290	505
	<i>Average daily gain (lbs/day/head)</i>	1.72	-0.29	2.86	2.25	0.57	3.57
	<i>Total costs (\$/head)</i>	44.48	44.48	44.48	15.27	12.19	44.48
	<i>Cost per pound of gain (\$/lb/head)</i>	0.74	-4.45	44.48	5.16	-2.44	0.61
	<i>Ending price (\$/lb)</i>	39.64	30.43	46.84	40.16	32.48	45.74
	<i>Net margin (\$)</i>	-111.62	-487.3	112.9	-73.15	-471.34	317.77
0-70 days (December 18)	<i>Weight (lbs)</i>	1,400.91	1,175	1,750	1,408.81	1,185	1,745
	<i>Total gain since culling (lbs)</i>	50.91	4.5	7.5	60.95	4.5	7.5
	<i>Average daily gain (lbs/day/head)</i>	0.73	-1.43	2.43	0.87	-2.29	1.14
	<i>Total costs (\$/head)</i>	85.20	12.19	96.73	37.61	23.7	96.73
	<i>Cost per pound of gain (\$/lb/head)</i>	1.67	-1.76	2.42	0.62	-4.74	23.7
	<i>Ending price (\$/lb)</i>	43.39	32.56	50.14	44.02	37.38	49.71
	<i>Net margin (\$)</i>	-90.76	-547.33	209.53	-45.68	-416.6	226.01
0-98 days (January 15)	<i>Weight (lbs)</i>	1,415.00	1,180	1,785	1,390.71	1,165	1,735
	<i>Total gain since culling (lbs)</i>	65.00	-265	580	42.85	-430	510
	<i>Average daily gain (lbs/day/head)</i>	0.66	-2.5	3.39	0.44	-2.32	2.14
	<i>Total costs (\$/head)</i>	122.63	23.7	144.62	59.08	32.35	144.62
	<i>Cost per pound of gain (\$/lb/head)</i>	1.89	-2.63	4.74	1.38	-6.47	32.35
	<i>Ending price (\$/lb)</i>	47.82	39.25	55.26	46.11	36.9	54.43
	<i>Net margin (\$)</i>	-66.43	-428.5	263.94	-28.41	-621.6	264.09
0-133 days (February 19)	<i>Weight (lbs)</i>	1,500.00	1,210	1,935	1,331.19	1,090	1,655
	<i>Total gain since culling (lbs)</i>	150.00	-250	685	-16.67	-110	145
	<i>Average daily gain (lbs/day/head)</i>	1.13	-2.14	4.29	-0.13	-3.57	1.29
	<i>Total costs (\$/head)</i>	172.46	32.35	213.67	102.78	47.33	213.67
	<i>Cost per pound of gain (\$/lb/head)</i>	1.15	-0.17	3.05	-6.17	-14.24	9.47
	<i>Ending price (\$/lb)</i>	52.03	41.72	56.84	52.34	47.95	59.03
	<i>Net margin (\$)</i>	-49.55	-441.52	276.2	5.42	-477.06	273.23
0-155 days (March 13)	<i>Weight (lbs)</i>	1,443.86	1,195	1,815	1,338.33	1,090	1,690
	<i>Total gain since culling (lbs)</i>	93.86	-230	580	-9.53	-460	465
	<i>Average daily gain (lbs/day/head)</i>	0.61	-6.82	0.91	-0.06	-1.82	3.64
	<i>Total costs (\$/head)</i>	195.45	47.33	250.99	122.06	57.59	250.99
	<i>Cost per pound of gain (\$/lb/head)</i>	2.08	-7.17	8.37	-12.81	-16.73	250.99
	<i>Ending price (\$/lb)</i>	50.55	37.5	57.37	48.49	35.23	55.84
	<i>Net margin (\$)</i>	-124.80	-508.84	129.54	-70.37	-629.29	226.42

Note: Cost per pound of gain will be negative when the cumulative gain of cows is negative for the weigh period. However, the cost of holding the animal continues to accrue.

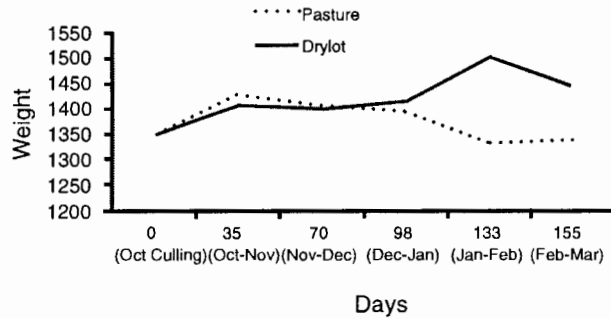


Figure 1. Year two average cow weight by management system and weigh date.

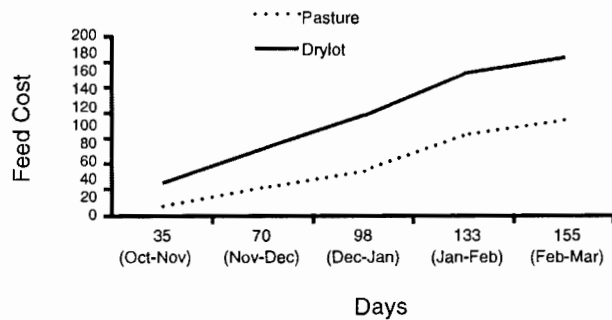


Figure 2. Year two average feed cost per cow by management system and weigh date.

Cost

Figure 2 shows cumulative feed cost at each weigh date for both drylot and pasture for year two. As expected, drylot feed costs were higher than pasture costs throughout the study period and increased at a slightly more rapid pace than pasture costs. Feed cost for cows in the dry lot setting was consistently higher than that for cows on forage. Note that a feeding cost per month is still assessed even if cows lost weight in that particular period.

Prices and Value Change

Figure 3 highlights cull cow prices at each feeding interval in year two, an important factor in determining cow value and

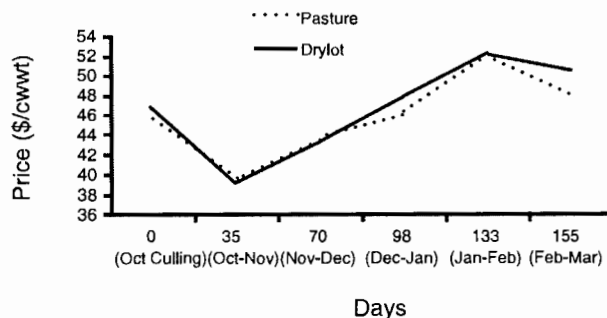


Figure 3. Year two average cull cow price by management system and weigh date.

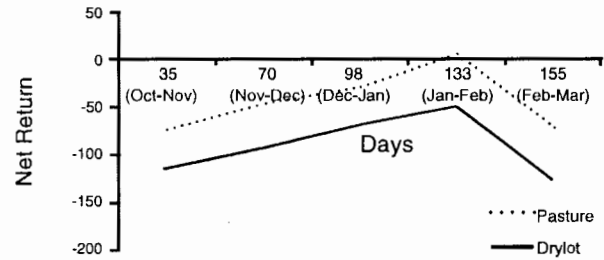


Figure 4. Year two average net returns by management system and weigh date.

sales timing. Prices at the culling date were marginally higher than in the subsequent period (Oct. 9 to Nov. 13). This price decline observed was in line with the typical seasonal pattern. Cull cow prices are generally at the seasonal low in Oct. and Nov., while prices are typically higher in the spring. Beyond Nov. 13 in year two, prices increased in the three subsequent time periods (70, 98 and 133 days) with the highest market price occurring at 133 days.

Net margins from feeding cull cows for alternative periods of time are affected by both revenues and costs. Since both weight gain and dressing percentage affect revenue, net margin tends to change as cows are fed longer. Market prices and the timing of marketing also are important in determining cow market value.

Net Margins

Net margins inform producer decisions on whether to keep cull cows beyond their culling period or to sell them immediately after culling. Positive net margins imply increased profit by retaining cull cows until the time period indicated, while negative net margins indicate that selling cows at culling would be more profitable than retaining them until the indicated period. Figure 4 shows net margins for management system by feeding interval for year two. Net returns for all scenarios in year two are negative, with the exception of marketing cows on grass at 133 days. For all intervals, net returns for cows on forage were higher (less negative) than for cows in the dry lot. Cows on grass experienced weight loss after the first period, but the cost of holding them also was relatively low as compared to feeding cows in a dry lot setting. Though cows in the drylot scenario gained weight through much of the study, the seasonal price increase during the study period was not enough to compensate for the additional feed cost. Thus, in the second year of this experiment, the best alternative was to keep cows on grass for 133 days (Nov. 13 to Feb. 19). All other alternatives yielded less profit than selling at culling.

Partial Budget Comparison

Table 2 compares partial budgets from the Beef Cattle Manual (Lalman and Doye, 2008) and partial budgets for the second year of the Noble cull cow feeding experiment. Such comparisons can be helpful for producers when deciding whether to hold cull cows beyond the culling date (Ward et al., 2008). Actual experimental results are used in the experiment's partial budgets, while common assumptions are used where necessary to generate the OSU partial budget. Therefore,

Table 2. Cull cow partial budget examples.

	OSU Budget	Feed					Pasture				
		0-35 days	0-70 days	0-98 days	0-133 days	0-155 days	0-35 days	0-70 days	0-98 days	0-133 days	0-155days
Traditional management											
Cull cow (marketing) weight (lbs.)	1,100	1,347.86	1,347.86	1,347.86	1,347.86	1,347.86	1,350.00	1,350.00	1,350.00	1,350.00	1,350.00
Shrink (%)	6.0	6	6	6	6	6	6	6	6	6	6
Sale weight (lbs.)	1034	1267	1267	1267	1267	1267	1269	1269	1269	1269	1269
Price (\$/cwt.)	45.00	45.06	45.06	45.06	45.06	45.06	46.63	46.63	46.63	46.63	46.63
Gross revenue (\$/head)	465.30	570.86	570.86	570.86	570.86	570.86	591.71	591.71	591.71	591.71	591.71
Cow feeding revenue											
Beginning cull cow weight (lbs.)	1,100	1,347.86	1,347.86	1,347.86	1,347.86	1,347.86	1,350.00	1,350.00	1,350.00	1,350.00	1,350.00
Days on feed	90	35	70	98	133	155	35	70	98	133	155
ADG (lbs./day)	1.0	2.18	-0.48	-0.21	-1.31	0.81	1.75	0.00	0.49	0.35	-0.66
Fed cow (marketing) weight (lbs.)	1190	1424	1314	1327	1174	1473	1411	1350	1398	1397	1247
Shrink (%)	4.0	4	4	4	4	4	4	4	4	4	4
Sale weight (lbs.)	1,142	1,367	1,261	1,274	1,127	1,414	1,355	1,296	1,342	1,341	1,197
Cull cow price from traditional management (\$/cwt.)	45.00	45.06	45.06	45.06	45.06	45.06	46.63	46.63	46.63	46.63	46.63
Price change from cull date to marketing date (\$/cwt.)	5.00	0	0	0	0	0	0	0	0	0	0
Price premium for increased BCS/quality grade (\$/cwt.)	1.50	0	0	0	0	0	0	0	0	0	0
Final price (\$/cwt.)	51.50	39.63	43.63	49.25	49.57	49.23	41.11	45.75	51.56	51.49	51.47
Gross revenue (\$/head)	588.34	541.93	550.45	627.43	558.78	696.07	556.98	592.97	691.92	690.54	616.22
Cow feeding costs											
Interest rate (%)	7.0	7	7	7	7	7	7	7	7	7	7
Cattle interest (\$/head)	8.03	4.60	8.54	12.15	14.67	17.95	4.77	8.85	12.60	15.21	18.61
Health supplies and medicine (\$/head)	2.00	2	2	2	2	2	2	2	2	2	2
Death loss (%)	0.00	0	0	0	0	0	0	0	0	0	0
Death loss (\$/head)	0.00	0	0	0	0	0	0	0	0	0	0
Labor and equipment (\$/head)	4.00	3.13	5.87	7.75	11.10	13.78	4.28	7.60	10.39	13.47	16.09
Feed, hay and pasture (\$/head)	70.00	12.14	31.74	51.33	91.68	108.28	38.18	77.60	112.25	159.00	179.35
Additional marketing costs (tags, commission, etc.) (\$/head)	3.00	3	3	3	3	3	3	3	3	3	3
Total cost (\$/head)	87.03	24.87	51.15	76.23	122.45	145.01	52.22	99.05	140.23	192.67	219.06
Traditional vs. cow feeding Summary (\$/head)											
Traditional gross revenue	465.30	616.17	616.17	616.17	616.17	616.17	651.72	651.72	651.72	651.72	591.71
Cow feeding gross revenue	588.34	546.30	567.77	585.03	618.87	155.14	540.10	563.56	587.88	604.76	529.51
Increased revenue	123.04	-69.86	-48.39	-31.13	2.70	-461.03	-111.62	-88.16	-63.84	-46.96	-62.21
Less retained ownership costs	87.03	24.87	51.15	76.23	122.45	145.01	52.22	99.05	140.23	192.67	219.06
Net return from cow feeding	36.00	-94.73	-99.54	-107.36	-119.75	-606.04	-163.84	-187.22	-204.07	-239.63	-281.26

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results from this comparison should be interpreted carefully. Note that the OSU budget is for a 90 day feeding period.

The OSU budget estimates net returns of \$36 per head at 90 days as compared to the experiment's results of -\$119.75 per head for cull cows held on grass. Note that there are some key differences between the OSU budget and the one based on experiment results. The OSU budget assumes a \$1.5 per cwt price increase for quality grade increases. Cows in the 2008-2009 experiment were initially culled with good body condition scores; thus, quality grade increases are likely more difficult and costly to achieve. Costs in the OSU budget are in the mid-range between cows in a dry lot setting and cows on grass. These costs continue to vary across producers and years, respectively, depending on the availability and quality of feeding resources (forage and grain) and the change in forage and grain prices over time.

The comparison between the actual and budgeted values provides an important insight to understanding how expected weight gain, costs incurred and carcass grade impact net returns. Net returns are not only influenced by weight gain, but also by seasonal price movements and feed costs. In fact, results suggest these two factors outweigh weight gain, given that the only profitable scenario in the 2008-2009 experiment is the cows on grass 133 days scenario, where cows are marketed at less than their culling weight. Therefore, producers should consider these factors when deciding whether to retain cull cows.

Comparison Across Experiment Years

When year two results are compared to those from year one, some similarities exist. For example, net returns in both year one (Figure 5) and year two (Figure 4) were consistently higher. Additionally, the highest net returns occur in late January to early February for both years. A comparison

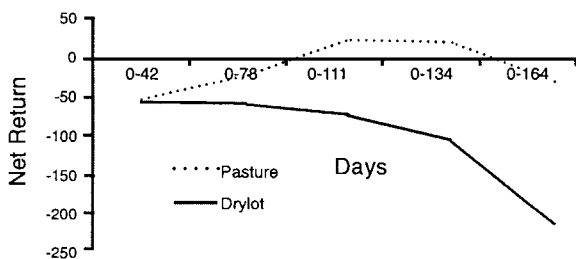


Figure 5. Year 1 Average Net Returns By Management System and Weigh Date.

of cull cow marketing prices across year one (Amadou et al. 2009) and year two (Figure 3) shows that the magnitude and seasonal movement of prices is similar. Thus, differences in net returns across years are likely attributable to differences in the cost of weight gain.

Summary and Conclusion

This fact sheet reports results from the second year of an experiment conducted at the Samuel Roberts Noble Foundation that examines the profitability of retaining cull cows beyond the culling date in two management systems. Cull cows were retained in dry lot and pasture/forage settings. Year two results indicated that holding cull cows on grass and marketing at 133 days was marginally profitable. However, results from the partial budget exercise suggested other profitable scenarios. In general, the second year results indicated limited or no profit potential in holding cull cows beyond culling, in contrast to year one. A comparison of year one from Amadou et al. (2009) and year two suggests that net returns of the pasture system are higher in both years relative to the drylot system, though year two generated much lower and mostly negative returns in both management systems as compared to year one. The profitability difference between year one and year two is primarily attributable to differences in feed and hay cost across years, reiterating the need for producers to consider available resources and current feed prices as they make the decision of whether to hold and feed cull cows.

References

- Amadou, Zakou. *Management Production Systems and Timing Strategies for Cull Cows*. Unpublished Master of Science thesis, Oklahoma State University, May 2009.
- Amadou, Zakou, Kellie Curry Raper, Jon Biermacher, Billy Cook and Clement Ward. *Adding Value to Cull Cows*. Oklahoma Cooperative Extension Service, Extension Fact Sheet AGEC-619, 2009. Available at <http://pods.dasnr.okstate.edu/docushare/dsweb/Get/Version-11027/AGEC-619pweb.pdf>
- 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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