Effect of Days Fed on Live Weight Gain and Carcass Characteristics

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Story in Brief

Large frame, mixed breed steers (n=467) were randomly allotted to one of 24 pens with six pens being serially harvested on d 117, 131, 145, and 159 of the feeding period. Live weights were measured at 28-d intervals and again 7 d prior to harvest. Following a 36-h chill, quality and yield grade data were obtained. Carcass weight and dressing percent increased linearly and quadratically as days fed increased. Marbling score increased linearly and quadratically with days fed. Percent low choice and premium choice also increased linearly with days fed. Yield grade increased linearly with days fed. Average daily gain and feed efficiency were not altered by days on feed. Net return per head increased linearly for steers when carcasses were priced on either a grid or the OSU Boxed Beef Calculator. Net return also tended to increase linearly if cattle had been sold on a constant live weight bid.

(Key Words: Steers, Carcass Characteristics, Serial Harvest.)

Introduction

Marketing feedlot cattle at the correct stage of production can markedly influence profitability. Mien marketing on a carcass basis, rather than a live basis, marketing too early can increase discounts for inadequate carcass grades and light carcass weights. During 1997, carcasses graded U.S. Select received an average of $7.67/cwt less than those graded U.S Choice. For carcasses under 550 lb, a discount of $25/cwt is often used. Likewise, over finishing cattle generates discounts due to heavy carcass weight and high yield grades. Discounts averaged $12/cwt and $17/cwt for yield grade 4 and 5 carcasses during 1997. Feed costs and cattle prices will also influence the optimum length of the finishing period. This study was conducted to evaluate the changes in carcass gains and characteristics and economic value of carcasses of cattle fed for different lengths of time.

Materials and Methods

Large frame, yearling, crossbred steers, primarily crosses of British and Continental cattle, that had grazed together during the summer in the high plains of Texas were obtained. Four hundred sixty-seven steers were trucked to Goodwell, OK on September 11, 1997, Of these steers, 233 were processed and sorted into 12 pens of 20 to 21 head each on September 11; the remaining 234 steers were processed and sorted the following day into an additional 12 pens. At processing, steers were eartagged and weighed and routine feedlot vaccinations (IBR, PI-3, 7-way clostridial vaccines) were administered. Steers were dewormed with ValbazenÒ on d 28 after worm populations in fecal samples were detected. All steers were implanted on d 0 with RalgroÒ ; steers were reimplanted with Revalor SÒ 90 d prior to the anticipated harvest date, The diets fed were prepared at Texas County Feeders in Guymon, OK and were trucked twice daily to Panhandle State University for feeding.

Cattle weights taken at arrival on September 11 were not pencil shrunk because these cattle should already be shrunk due to transport. However, all weights taken during the trial were shrunk by 4% to account for digestive tract fill. All steers were weighed 7 d prior to each harvest date. These final live weights taken were shrunk only 2% to account for fill and the added gain between weighing and harvest dates. On d 117, 131, 145, and 159, six pens of cattle were transported to Dodge City, KS where they were harvested at Excel. Incidence of tongue lesions, liver abscesses and lung lesions was recorded. At 36 h postmortem, carcass measurements were taken.

Cattle were priced on a live, a grid and an OSU Boxed Beef Calculator basis. Values for grid pricing are outlined in Table 1. A description and discussion of the OSU Boxed Beef Calculator

may be found in a subsequent article.

Results and Discussion

Live weight daily gains and feed to gain ratios were not significantly different between days fed (Table 2). At 56 d on feed, however, steers harvested on d 117 and 159 had gained less than steers that were harvested on the other dates. Although reimplanting might influence gain and feed intake, no clear explanation for the decreased rate of gain for these sets of steers is available. These differences in performance disappeared as the study progressed. Feed to gain ratios over the entire trial were similar across harvest dates.

Carcass weights increased linearly and quadratically (P<.01) with days fed (Table 3). Dressing percent also increased linearly and quadratically (P<.01) as days increased. Marbling scores increased linearly (P<.01) with days fed. Percent low choice and premium choice increased linearly (P<.05 and P<.01) over time. The percent of carcass weight comprised of kidney, pelvic and heart fat also increased linearly and quadratically (P<.01) with days fed. As expected, with increased days fed and increased fat deposition, yield grade increased linearly (P<.01). The percent of carcasses receiving yield grades of 4.5 or greater increased linearly and quadratically (P<.01) with days fed while the percent of carcasses receiving yield grades of 2 or less decreased linearly (P<.01) with days fed.

Maturity score increased linearly (P<.01). This change is surprisingly large over a 6-wk period. Linear, quadratic and cubic (P<.01) changes were seen in ribeye area.

Economic returns were estimated for the various feeding periods. Input costs were as follows: purchase price=$70/cwt, feed cost=$8.71/cwt dry matter, and fixed cost (yardage, medication and interest) of $.28/head/day. Cattle were priced on a live, a grid and a boxed beef value basis. The average live weight price for 1997, of $65.50/cwt was used for live value net return calculations. The price structure for the grid was given in Table 1. Freight of $0. 1 8/cwt was added to the input cost for grid value pricing.

Special considerations were made during value calculations for stipulations required during the experiment. Heavy weight discounts were not used for pricing because heavy weight steers were topped off in this study. Yield grade discounts were not applied to carcasses until calculated yield grades of 4.5 were reached. Discounts were applied at this level because the USDA assigned yield gra, des all were much lower than yield grades calculated from component measurements. USDA yield grades of 4 or greater were assigned to 1, 0, 5, and 4 carcasses on harvest days of 117, 131, 145, and 159, respectively; the number of calculated yield grades 4 and 5 much exceeded the number of USDA yield grade 4 and 5 carcasses (Table 3).

When marketed on a live weight basis, net return tended to increase (P=.10) in a linear trend as days fed increased. This reflects the fact that cost of gain was lower than live weight price. When using the grid for marketing, net return showed a linear increase (P<.01) with days fed. This may be attributed to increased carcass weights and a higher percent of U.S. Choice carcasses. When the OSU Boxed Beef Calculator is used for pricing, net return increased both linearly (P<.01) and quadratically (P<.05).

Implications

As days fed increases, marbling scores are also expected to increase, as well as premiums for carcass quality grade. Cattle should be marketed when a high percentage will grade choice and while low percentages of yield grade 4 and 5 carcasses are maintained. However, live weight gain and its impact on cost of gains should be monitored due to the large role it plays in profitability.

Table 1. Discounts and premiums for determining carcass value in a grid structure.

Base value	Quality grade		Yield grade	
$106.83/cwt	Standard	-$14	1	+$3
	Select	-$7.67	2	+$2
	Choice	0	3	0
	Upper 2/3 choice	+$2	4	-$12
	Prime	+$5	5	-$17

Table 2. Effect of days fed on live performance.

	Days fed				Effect
Performance trait	117	131	145	159	-
Number of steers	117	115	120	115	-
Number of pens	6	6	6	6	-
Weight, lb					
Initial	794	791	794	792	
Final^L	1218	1280	1330	1374	P<.01
Average daily gains					
0-56	3.54^a	3.80^{bc}	3.71^{ac}	3.39^a	-
56-harvest	3.70^a	3.60^a	3.71^a	3.80^b	-
0-harvest	3.62	3.72	3.71	3.65	-
Feed/Gain	5.83	5.88	5.80	5.76	-

[a,b,c] means with different superscripts differ (P<.05).
[L] Values are linear.

Table 3. Effect of days fed on carcass characteristics.

	Days fed				Effect	
Carcass trait	117	131	145	159	Linear	Quadratic
Hot carcass wt, lb	755	807	841	887	.01	.01
Dressing percent	62.3	63.4	63.6	64.9	.01	.01
KPH, %	1.92	2.16	2.22	2.34	.01	.01
Maturity score	154.2	161.2	165.1	170.1	.01	.01
Marbling score[a]	400	413	441	457	.01	.05
Percent low choice	39.47	46.90	53.41	61.79	.05	-
Percent premium	7.67	7.85	18.16	18.34	.01	-
Choice						
Ribeye area, sq in	12.79	12.90	12.52	13.61	.01	.01
Yield grade	2.78	3.17	3.59	3.70	.01	-
Yield grade 1&2, %	61.55	42.58	22.07	15.02	.01	-

Yield grade >4.5, %	.83	2.63	6.95	17.49	.01	.01
Net return, $/head						
Live wt basis	-5.74	-1.48	4.23	8.62	-	-
Grid	-23.38	-4.29	2.58	12.86	.01	-
Box beef	-11.58	-4.22	0.33	22.32	.01	.05

[a]300-399, slight; 400-499, small.