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Clayton Livestock Research Center

PROGRESS REPORT

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INFLUENCE OF RECEIVING AND GROWING-FINISHING FEEDS ON THE PERFORMANCE OF BEEF STEERS

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It has been shown that when highly stressed calves are received on low energy feeds they make compensatory growth during subsequent growing-finishing periods but usually will not compensate fully for the poor gains made in the receiving period (see Progress Report No. 31). Calves received on a high energy feed gained enough more during the receiving period that they still maintained a gain advantage at slaughter despite lower rates of gain during growing and finishing. Calves subjected to less stress and fed low energy receiving feeds made more rapid compensatory growth than high stress calves and those received on only grass hay compensated fully for their poor gains of the receiving period. The evidence suggests that highly stressed calves should be received on high energy feeds while calves not highly stressed could be received on hay only. The influence of growing-finishing feed on compensatory growth and performance of calves received on high and low energy feed were also studied. This progress report discusses the effects of growing calves to 600 lb on 50% concentrate ration prior to feeding an 85% concentrate ration compared to feeding the 85% concentrate feed throughout the growing-finishing period.

Three hundred seventy-seven stocker calves weighing approximately 365 lb were trucked from Florida to Clayton. In-transit shrink varied from 6.1% to 12.2% with an average of 9.3% from purchase to arrival. Calves were processed the morning after arrival having had access to hay and water overnight. Each calf received LA200 at 9 mg oxytetracycline per lb body weight and two albon SR boluses at processing. The three receiving feeds consisted of: (1) native grass hay fed for 4 weeks, (2) native grass hay plus 2 lb/day of a 40% protein supplement fed for 4 weeks and (3) a 75% concentrate milled feed fed free choice for 4 weeks plus grass hay limited to the first week (see Progress Report No. 31 for the composition of the protein supplement and the 75% concentrate milled feed). Following the 4-week receiving period all calves were fed a 50% concentrate milled feed for 14 days to equalize differences in fill resulting from the different receiving feeds. Half the calves on each of the three receiving rations were fed an 85% concentrate milled feed throughout a 196-day growing-finishing period. The other half was fed a 50% concentrate milled feed to a body weight of 600 lb, then fed the 85% concentrate feed for the remainder of the 196-day growing-finishing period.

The first three columns of table 1 contain the data for the calves fed the 85% concentrate ration throughout the growing-finish-

[1] Appreciation is expressed to Dr. T. H. Montgomery, West Texas State University for collection of the carcass data.

TABLE 1. TOTAL FEED INTAKE AND WEIGHT GAINS (PER HEAD)

	Growing-finishing feed					
	85% concentrate throughout finishing			50% concentrate to 600 lb then 85%		
	Receiving feed					
	Hay only 4 weeks	Hay plus protein suppl. 4 weeks	75% conc. 4 weeks plus hay 1st week	Hay only 4 weeks	Hay plus protein suppl. 4 weeks	75% conc. 4 weeks plus hay 1st week
	Receiving and fill standardization period (42 days)					
Feed intake, lb	411	480	538	474	517	576
Weight gain, lb	42	66	108	48	73	117
Feed/lb gain, lb	9.79	7.27	4.98	9.88	7.08	4.92
	Growing - finishing period (196 days)					
Feed intake, lb	3647	3705	3681	4017	3898	3802
Weight gain, lb	581	577	548	603	568	535
Feed/lb gain, lb	6.28	6.42	6.72	6.66	6.86	7.11
	Entire 238 days					
Feed intake, lb	4058	4185	4219	4491	4415	4378
Weight gain, lb	623	643	656	651	641	652
Feed/lb gain, lb	6.51	6.51	6.43	6.90	6.89	6.71
Cost of gain:						
Total, $[a]	328.67	340.38	346.13	354.69	352.52	354.53
Per lb gain, ¢	52.76	52.94	52.76	54.99	55.60	55.14
Gross value of gain, $[b]	404.95	417.95	426.40	419.25	412.10	417.95
Net value of gain, $	76.28	77.57	80.27	64.56	59.58	63.42

[a] Includes costs of processing, medication, death loss, interest and feed ingredient cost plus $14/T markup.

[b] Gain valued at 65¢/lb.

FIGURE 1. COMPENSATORY GAINS OF CATTLE FED 85% CONCENTRATE THROUGHOUT THE FINISHING PERIOD

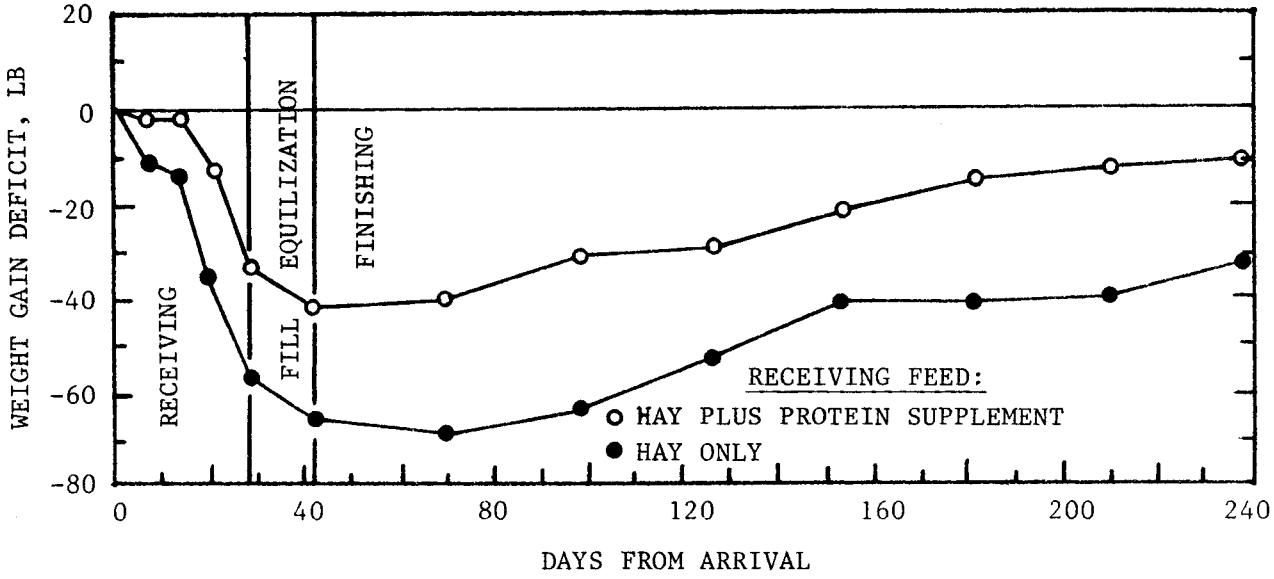
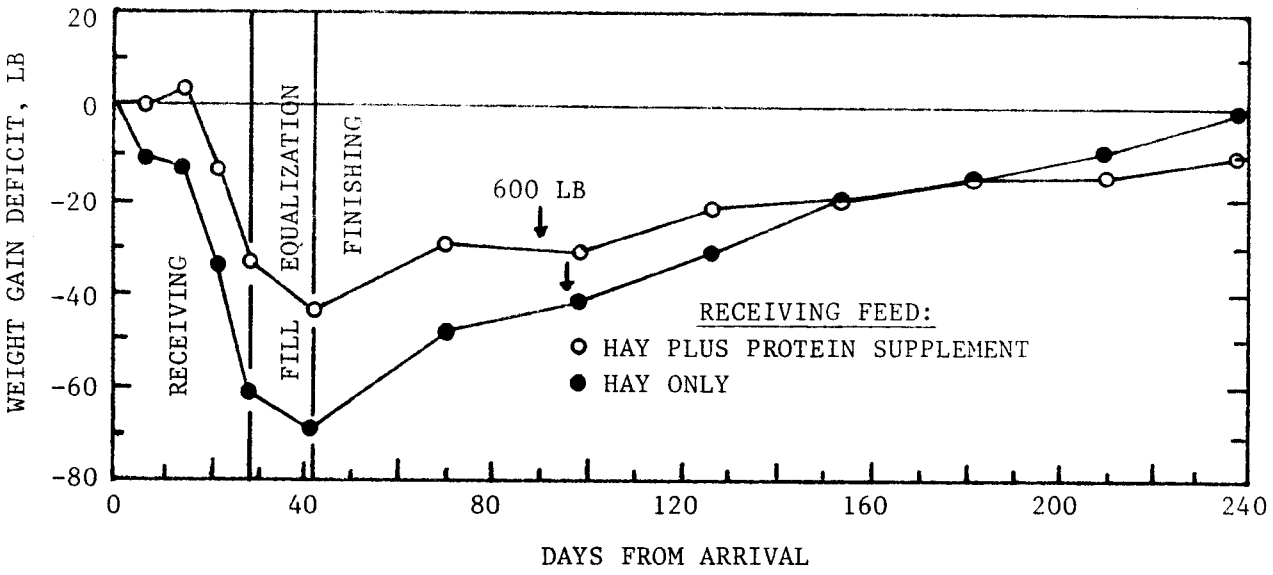


FIGURE 2. COMPENSATORY GAINS OF CATTLE FED 50% CONCENTRATE TO A BODY WEIGHT OF 600 LB THEN 85% CONCENTRATE



ing period. During the 42-day receiving and fill equalization period calves received on hay alone for 4 weeks or hay plus a protein supplement had gained 66 and 42 lb less than calves received on the 75% concentrate for 4 weeks plus grass hay the first week. During the subsequent 196 days on the 85% concentrate feed the calves received on hay alone had made up 33 lb of the 66 lb gain deficit. Those received on hay plus protein supplement made up 29 lb of their 42 lb deficit. Figure 1 shows the gain deficit of the two groups and the rate of compensatory growth. Carcass data for these cattle (first 4 columns of table 2) show no significant differences except in carcass weight which merely reflects the total weight gain made by the three groups of calves.

With gain valued at 65¢/lb, the greatest net value of the gain above cost was achieved on the 75% concentrate receiving feed with the lowest net value being achieved by those received on hay alone. Cost and return data are valid only for conditions prevailing at the time of the analysis. However, from the production data one can apply other costs.

The last three columns in table 1 present a comparison of the same three receiving feeds when the calves were fed a 50% concentrate feed to a weight of 600 lb prior to feeding the 85% concentrate finishing feed. Calves received on hay only or hay plus protein had gain deficits of 69 and 44 lb, respectively, compared to the calves received on 75% concentrate plus hay. At slaughter the group received on hay alone had regained 68 lb of the 69 lb deficit and thus had essentially fully compensated for the poor gains of the receiving period. Those calves received on hay plus protein regained 33 lb of their 44 lb deficit.

The carcass data for these three groups (table 2) show no differences except in carcass weight which again reflects the total weight gained by the three groups. The gain deficits and compensatory growth of these calves are shown in figure 2. Compensatory growth of the calves received on hay alone was more rapid than that of those calves received on hay plus a protein supplement.

The cost analysis (table 1) for these three groups shows the highest net value of weight gain for calves received on hay alone followed by those received on 75% concentrate with the highest cost and lowest net value of gain being observed in the group received on hay plus the protein supplement.

A comparison of the carcass characteristics for all calves fed 85% concentrate, throughout the growing-finishing phase with those grown to 600 lb prior to receiving the 85% concentrate ration indicates a slightly larger size (carcass weight, and rib eye

TABLE 2. CARCASS CHARACTERISTICS

Item	Growing-finishing feed: 85% conc. throughout finishing — Receiving feed: Hay only	Hay + prot.	75% conc.	Means	50% conc. to 600 lb then 85% — Receiving feed: Hay only	Hay + prot.	75% conc.	means
Carcass weight, lb	649[a]	669[bc]	678[c]	665	670[bc]	664[b]	680[c]	671
Rib eye area, in^2	12.0	12.2	12.1	12.1[a]	12.2	12.2	12.5	12.3[b]
Back fat, in	.62	.60	.62	.61	.58	.56	.58	.57
Yield grade	3.0	3.1	3.0	3.0[b]	2.9	2.8	2.9	2.9[a]
Marbling score[d]	4.8	4.9	4.9	4.9	4.8	4.8	4.7	4.8
Quality grade[e]	12.0	12.1	12.0	12.0	12.0	11.8	11.4	11.7

[abc] Means in appropriate comparisons having different superscripts differ ($P<.05$)

[d] Marbling key: 3 = traces, 4 = slight, 5 = small

[e] Quality key: 10 = good, 11 = high good, 12 = low choice, 13 = choice

area) but less finish (back fat, yield, marbling and quality grade) for those grown to 600 lb prior to receiving the 85% concentrate feed.

Under the conditions of this study the lowest cost of gain and greatest net value of gain were achieved when the 85% concentrate was fed throughout growing-finishing rather than growing to 600 lb prior to feeding the 85% concentrate ration.

Consideration of all the data presented leads to the conclusion that calves should usually be received on a high energy milled feed for 4 weeks plus grass hay limited to the first week with a high energy finishing feed being fed throughout the finishing period. However, changes in ownership of cattle will have an effect upon management procedures since costs and returns differ from different periods of the operation and are influenced by the procedure followed in previous periods.

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