

A Comparison In Feedlot Performance of Steers Allowed A Growing Period With Steers Placed on A Finishing Ration at Weaning

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Story in Brief

A 194 day feeding trial involving 91 Angus steers was conducted at the Fort Reno Livestock Research Station to compare the performance of weaning calves placed directly on a finishing ration with that of steers allowed a growing period before being placed on a high concentrate finishing ration. One group was placed on a high roughage grower ration for the first 76 days of the trial before changing to a high concentrate finishing ration while the other group was placed directly on the high concentrate finishing ration at the time the calves were weaned.

The feeding trial was divided into two periods. The first consisted of 76 days where one group was on the grower ration and the second consisted of the remaining 118 days of the trial during which both groups were on the same finishing ration. Total weight, average daily gain, and change in wither height significantly favored the concentrate group at the end of the first period. Average daily gain during the last period was significantly higher for the steers that had been on the grower ration. However, average daily gain for the entire feeding trial as well as final weight was not significantly different. Over the entire feeding trial, the steers on the finishing ration required 0.57 pounds less feed per pound of gain than the steers on the grower ration. In general the carcass traits were similar for the two treatment groups, however, average fat thickness, carcass grade and marbling were significantly higher for the calves on the finishing ration. Total cost per pound of gain was 0.5 cents higher for the calves that initially began on the grower ration.

Introduction

Increasing per capita consumption of beef with an ever decreasing land mass for grazing has stimulated research concerning the effects of

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placing weaning calves directly into the feedlot rather than allowing a growing phase prior to the finishing phase. The purpose of this study was to compare feedlot performance and carcass composition of calves placed directly on a finishing ration with those allowed a growth period prior to entering the finishing phase.

Materials and Methods

A 194-day feeding trial was conducted to compare feedlot performance of 205 day old calves placed directly on a high concentrate finishing ration with calves allowed a growing period of 76 days before being placed on the finishing ration. The 94 choice Angus steers initially allotted to this experiment were the progeny of 10 sires involved in a progeny test as part of the beef cattle breeding project. Half of the progeny from each sire were randomly allotted to each of the two treatment groups in such a way that the overall actual weaning weights were quite similar for the two treatments.

The steers were weaned at an average age of 205 days at the Lake Carl Blackwell range and were transported to the Fort Reno Livestock Research Station where they were immediately placed on test. Three animals died while on test (one on the grower ration and two on the finishing ration) and data from those were excluded from the analysis. The final analysis was completed on 45 calves on the grower ration and 46 calves on the finishing ration. The composition of the rations and supplements are presented in Tables 1 and 2, respectively. The rations were fed *ad lib* during the 194 day feeding trial. The steers were fed in two adjoining pens that opened to the south from a feeding barn.

The feeding trial was divided into two periods. The first consisted of 76 days during which one set of steers was fed the grower ration while the other set of steers was placed directly on a high concentrate finishing ration. The second period consisted of the remaining 118 days of the feeding trial. During the second period the steers originally on the grower ration were allowed an adjustment period of the first 21 days in which the milo level was gradually increased from 50 to 78 percent. From this point until the end of the trial both sets of steers were on the same finishing ration.

Twenty random steers from each treatment group was evaluated by the K⁴⁰ counter at the OSU Live Animal Evaluation Center and subsequently slaughtered in the OSU Meat Laboratory. In addition to the normal carcass measurements, specific gravity was determined for the right side of each carcass. The balance of the steers were slaughtered at a commercial packing plant and only the normal carcass measurements were obtained.

Table 1. Composition of Rations

Ingredient	Cost/Cwt	Amount in Percent	
		Grower Ration	Finishing ¹ Ration
Alfalfa Hay	\$ 1.80	84	8
Dry Rolled Milo	2.30	5	78
Wheat Straw	1.00		4
Molasses	1.75	6	5
Supplement (No. 1)	3.70	5	
Supplement (No. 2)	4.74		5
	TOTAL	100	100

¹ The percentages reflect the finishing ration fed after an adjustment period of 26 days during which the milo level was gradually increased from 50 to 78 percent.

Table 2. Composition of Supplements¹

Ingredient	Amount in Percent	
	Supplement 1	Supplement 2
Salt	8.000	8.000
Dicalcium Phosphate	6.000	
Calcium Carbonate		10.000
Stilbesterol, 2 g/lb.	0.625	0.625
Aureomycin, 10 g/lb.	1.250	1.250
Vitamin A ²	0.625	0.625
Trace Minerals	0.500	0.500
Wheat Middlings	83.000	
Urea, 45% N		12.000
Soybean Oil Meal, 44% CP		67.000
	TOTAL	100.000

¹ Both supplements were pelleted.

² Four million I.U. per lb.

Results and Discussion

The feedlot performance data from the two treatment groups are presented in Table 3. The initial weights were obtained on the steers immediately after being unloaded from the trucks at Fort Reno and prior to being placed in the feeding pens. They shrank 8.8 percent of their weaning weight going from Stillwater to Fort Reno. The slight difference in the initial weights of the two treatment groups was probably due to the initial allotment to treatment groups being based on weaning weights and the data on three steers that died being eliminated from the analysis.

Table 3. Feedlot Performance Data (194 Days)

Traits Measured	Grower Ration Steers	Finishing Ration Steers	Difference (Finishing-Grower)
Number of steers	45	46	
Initial weight, lbs.	435	430	-5
Final weight, first period, lbs.	603	646	43 **
Change in wither height, first period, in.	2.55	3.17	0.62**
ADG first period, lbs.	2.22	2.84	0.62**
Final feedlot weight, lbs.	982	980	-2
ADG last period, lbs.	3.21	2.83	-.38**
ADG total, lbs.	2.82	2.83	0.01
Lbs. feed/lb. gain, first period	6.74	5.52	-1.22 ¹
Lbs. feed/lb. gain, last period	6.49	6.30	-.19 ¹
Lbs. feed/lb. gain, total	6.57	6.00	-.57 ¹

¹ Statistical tests of significance were not possible since feed efficiency was determined on a treatment group basis.

**Treatment means different at the 0.01 probability level.

As expected, total weight and average daily gain at the end of the first 76 days significantly favored the group of steers on the finishing ration. Also the steers on the finishing ration had a 1.22 lb. advantage in feed efficiency. This would appear to be a real difference, although it was not possible to make a statistical test of significance because feed efficiency was determined on a group rather than individual basis. Change in wither height during the first period was significantly greater for the steers on the finishing ration, indicating that structural growth occurred at a faster rate on the finishing ration than on the grower ration. Average daily gain for the last 118 days was significantly higher for the calves that were previously on the grower ration. It should be noted that although the finishing ration steers did not gain as rapidly as the grower ration steers during the final feedlot period, they were slightly more efficient in terms of pounds of feed required per pound of gain.

The most striking result of the feedlot performance was that average daily gain for the total feeding trial and final weight off test were not significantly different for the two treatments. Even though total feedlot gain was essentially the same for the two treatments, the group of steers on the finishing ration for the entire feedlot period was slightly more efficient in terms of pounds of feed required per pound of gain. The 1.22 lb. advantage in feed efficiency for the finishing ration steers during the first period and 0.19 lb. advantage during the last period resulted in a 0.57 lb. advantage over the total feeding trial.

In general the carcass traits were similar for the two treatment groups (Table 4). Although the final feedlot weight was essentially the same for the two groups the hot carcass weight was 12 lbs. heavier for the finishing

Table 4. Carcass Data

Traits Measured	Grower Ration Steers	Finishing Ration Steers	Difference (Finishing- Grower)
Number of steers	45	46	
Hot carcass weight, lbs.	589	601	12
Ribeye area, sq. in.	10.83	10.75	— .08
Kidney, heart and pelvic fat, %	2.87	3.02	0.15
Average fat covering, in.	0.73	0.85	0.12**
Carcass conformation ¹	11.78	11.91	0.13
Carcass grade ¹	9.36	10.02	0.66**
Marbling ²	4.58	5.11	0.53**
Cutability ³	49.25	48.53	— .72
Carcass length, in.	45.89	45.59	— .30
Carcass width, in.	14.82	14.92	0.10
Tenderometer ⁴	17.18	17.34	0.16
K ⁴⁰ count, counts/min. ⁵	14,049	14,066	17
Specific gravity ⁶	1.048	1.045	— .003

¹ USDA carcass conformation and grades converted to the following numerical designations: high choice—12, avg. choice—11, low choice—10, high good—9.

² Marbling score equivalents: moderate—7, modest—6, small—5, slight—4.

³ Estimated percentage boneless retail cuts from the round, loin rib and chuck of hot carcass weight.

⁴ Smaller values indicates a more tender cut.

⁵ Measurements obtained only on a random sample of 40 steers (20 from each treatment).

**Treatment means different at the 0.01 probability level.

ration steers. However, this difference was not statistically significant. The finishing ration resulted in a larger amount of fat as indicated by significantly more fat over the 12th rib and a higher marbling score. Consequently, the finishing ration steers received a significantly higher carcass grade. Although the steers on the finishing ration were somewhat fatter at the 12th rib, net K⁴⁰ counts per minute and specific gravity did not indicate any significant difference in body composition.

An economic evaluation of these cattle is presented in Table 5. Cost per pound of gain was computed using feed costs as shown in Table 1 and a charge of 0.12 cents per head per day yardage fee. On this basis the cost per pound of gain was 0.5 of a cent per pound less for the finishing ration. Cost per pound of gain may seem comparably low but this was primarily due to the extremely high feed efficiency obtained by both groups of cattle.

Results from this study suggest that calves can be taken directly off the cows at an average age of 205 days and placed immediately into the feedlots on a finishing ration, and that these calves will grow and result in feedlot performance and carcass composition that is equivalent to and in some cases better than that obtained from cattle allowed a growing period before entering the feedlots. This study indicates that comparable performance from weaning to slaughter can be obtained on this kind of

cattle by either system of management. The actual choice will be highly dependent upon the relative availability and cost of roughages and concentrates in a particular situation.

Table 5. Economic Evaluation of Feedlot Performance

Items	Cost/lb. of gain	
	Grower Ration	Finishing Ration
Number of steers	45	46
Total lbs. gained	24,610	25,285
Ration costs	\$.143	\$.139
Yardage @12¢/head/day	.043	.042
Total cost	\$.186	\$.181

Effect of Milo Preparation on Energy Utilization by Feedlot Steers as Determined by Respiration Calorimetry and Comparative Slaughter

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Story in Brief

Eighteen Yearling Hereford steers were used to measure the energetic efficiency of feedlot rations containing dry rolled (DR) or reconstituted (38 percent moisture) rolled (RR) milo, and to compare respiration calorimetry and the comparative slaughter technique as methods for determining net energy of high concentrate feedlot rations. Net energy of the RR grain ration was significantly ($P < .01$) greater than the DR grain ration during the feedlot phase as determined by the comparative slaughter technique.