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Conventional vs accelerated beef production for traditional and later-maturing cattle types (1979)

S.M. Myers

Michael E. Dikeman

Jack G. Riley

Conventional versus Accelerated Beef Production for Traditional and Later-maturing Cattle Types

Stan M. Myers, Michael E. Dikeman, and John B. Riley

Summary

Analysis of traditional and later-maturing cattle types fed under accelerated (placed directly on the finishing ration) and conventional (backgrounded on a growing ration before finishing) systems, indicated large differences between feeding systems but smaller differences between cattle types in the same feeding system. Differences between feeding systems stress the economic importance of maintaining maximum gain, and the disadvantages of extended feeding periods, when much of the feed consumed is required for maintenance. Later-maturing cattle on accelerated feeding required the least feed per pound of gain.

Introduction

The cattle feeding industry must produce efficiently a product whose value is subject to quality standards. With the prospect of an extended period of strong feeder cattle prices, inefficient producers will find it increasingly difficult to compete with more efficient producers. This study was designed to provide efficiency comparisons by identifying production differences associated with cattle types and feeding systems, assuming like-quality end products.

Experimental Procedure

Two groups of crossbred steers, 24 Hereford X Angus (traditional) and 23 Simmental-sired steers from either Chianina X Angus or Chianina X Hereford females (later-maturing), were obtained from the U.S. Meat Animal Research Center at Clay Center, Nebr. They were approximately 8 months old and averaged 568 lb. when purchased. Following an adjustment period, half of each group was allotted by weight to one of two feeding regimes. Twelve traditional and thirteen later-maturing steers were allocated to the accelerated feeding system. Twelve of each type were allocated to the conventional feeding system.

Accelerated feeding consisted of a 4-week adjustment period then a finishing phase. Lengths of finishing periods for cattle types differed to facilitate the production of end products similar in eating quality. The conventional feeding system consisted of adjusting, backgrounding, and finishing phases with the length of backgrounding adjusted to promote end products similar in eating quality. Feeding systems are summarized in Table 17.1.

Weight and average feed consumption were recorded every other week for each cattle type in a given feeding system. All steers were slaughtered at Kansas State University where quality and yield grades were determined.

Rib steaks were evaluated by a trained taste panel for flavor and juiciness and evaluated for tenderness by the taste panel and Warner-Bratzler shear.

Results and Discussion

The accelerated feeding system was more efficient (less feed per pound of gain) because much of the feed consumed during backgrounding in the conventional system was used for maintenance.[1] Sixty-seven percent of the backgrounding ration was low-energy-density prairie hay, which was the major contributor to high feed/gain ratios characteristic of the backgrounding phase. With the conventional feeding system, 1 lb. of finishing ration substituted for 2.65 lb. of the backgrounding ration. Thus, the backgrounding ration would have to be purchased at 37.57%[2] of the cost of the finishing ration for costs of gain to be equal. Feasibility of backgrounding depends upon: consumption, energy density of the backgrounding ration, cost ratio comparing backgrounding and finishing rations, beginning weight, projected length of finishing period, and desired end weight.

Differences between cattle types in feeding systems were not as large as differences between feeding systems. Within the accelerated feeding system later-maturing steers performed more efficiently so higher daily gains would reduce yardage and interest costs. Within the conventional feeding system traditional steers were more efficient, partly due to a shorter backgrounding period. Daily gains were slightly lower for traditional cattle, so yardage costs per pound of gain were slightly higher. However, interest costs per pound of gain were higher for the later-maturing, conventionally fed steers because of accumulated interest for additional time. A production summary is provided in Table 17.2.

Ribs steaks from steers on the accelerated system and from those on the conventional system, were judged equally flavorful by a trained taste panel, and equally tender by the Warner-Bratzler shear, even though steers slaughtered on the accelerated system graded lower.

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[1] Maintenance computations assumed production within the thermal neutral zone. That facilitates comparison, but maintenance requirements were higher than those stated.

[2] Includes additional yardage and interest costs associated with extended time required to produce equal gain.

Table 17.1. Feeding systems for two cattle types.

	Traditional, accelerated		Later-maturing, accelerated		Traditional, conventional			Later-maturing, conventional		
	Adjustment period	Finishing period	Adjustment period	Finishing period	Adjustment period	Backgrounding period	Finishing period	Adjustment period	Backgrounding period	Finishing period
	Percentages on dry matter basis (D.M.B.)									
Feed ingredients										
Corn (89% D.M.)	57.2	86.0	57.2	85.3	15.7	----	82.5	15.7	----	81.3
Grain sorghum (89% D.M.)	----	----	----	----	15.1	29.8	----	15.1	28.9	----
Corn silage (40% D.M.)	11.8	9.6	11.8	10.4	----	----	8.0	----	----	2.5
Sorghum silage (40% D.M.)	25.4	----	25.4	----	15.9	----	5.1	15.9	----	11.8
Prairie hay (91% D.M.)	----	----	----	----	48.6	66.3	----	48.6	67.3	----
32.6% Crude protein (D.M.B.) Supplement (85% D.M.)	5.6	4.4	5.6	4.3	4.7	3.9	4.4	4.7	3.8	4.4
% Dry matter	61	79	61	79	75	90	77	75	90	76
% Crude protein	10.6	10.8	10.6	10.8	10.2	10.3	10.7	10.2	10.3	10.7
Days on feed	28	112	28	154	28	113	117	28	155	123
(Total days)		(140)		(182)			(258)			(306)

Table 17.2. Summary of production data from feeding tests with traditional and later-maturing steer types.

	Traditional, accelerated			Later-maturing, accelerated			Traditional, conventional			Later-maturing, conventional		
	Beginning weight	Ending weight	Gain	Beginning weight	Ending weight	Gain	Beginning weight	Ending weight	Gain	Beginning weight	Ending weight	Gain
Weight gains, lbs.												
Adjustment	572	648	76	563	645	82	568	638	70	568	656	88
Backgrounding	---	---	---	---	---	---	638	755	117	656	842	186
Finishing	648	947	299	645	1113	468	755	1172	417	842	1303	461
Total	572	947	375	563	1113	550	568	1172	604	568	1303	735
Consumption/day	lbs. (D.M.) per head per day											
Adjustment		17.0			17.0			16.7			16.0	
Backgrounding		----			----			17.8			21.7	
Finishing		17.0			18.2			24.2			27.5	
Total		17.0			18.0			20.6			23.4	
% of Feed consumption required for maintenance	percent											
Adjustment		35.2			34.4			46.5			49.1	
Backgrounding		----			----			53.8			47.0	
Finishing		38.2			38.5			31.3			30.3	
Total		37.5			38.1			41.2			39.8	
Average daily gain	lbs. per head per day											
Adjustment		2.7			2.9			2.5			3.1	
Backgrounding		---			---			1.0			1.2	
Finishing		2.7			3.1			3.6			3.8	
Total		2.7			3.0			2.3			2.4	
Efficiency (F/G)	lbs. feed (D.M.) per lb. gain											
Adjustment		5.6			5.3			6.4			4.9	
Backgrounding		---			---			17.4			18.1	
Finishing		6.1			4.7			6.5			6.9	
Total		6.0			4.7			8.6			9.5	
Quality grade[1]		8.7			8.0			9.8			9.1	
% Choice		25.0			23.1			83.3			50.0	
Yield grade		3.33			2.30			4.00			2.30	

[1]Quality grade: 15, 14, 13 = Prime; 12, 11, 10 = Choice; 9, 8, 7 = Good; 6, 5, 4 = Standard.