Comparison of Cattle Types and Management Systems

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Summary

No differences were found in total feed energy required to produce a pound of retail cuts between breeds or management systems. However, across breeds, faster gaining steers were more efficient. When yardage, facilities, labor and interest were also considered, faster gaining cattle and accelerated management programs were more economical.

Introduction

During the last 15 years the availability of different cattle types and the relative value of feeding facilities, equipment, land, interest rates, feed and labor have changed drastically. For cattle production to be profitable, producers must re-evaluate all resources and be willing to make changes as needed. We compared two cattle types and two post-weaning management systems for energetic efficiency of beef production.

Experimental Procedure

Twenty Simmental and 21 Polled Hereford steers were fed either an accelerated or conventional feeding program. Steers on the accelerated program were placed on a finishing ration (90% rolled milo plus supplement, 10% corn silage, dry basis) 33 days after weaning at an average age of 7½ months. Steers on the conventional program were fed sorghum and corn silage from 7½ months to 11 months of age before being placed on the finishing ration. Steers were slaughtered at high Good to low Choice quality grades. Records were analyzed from conception through slaughter on both the dam and the calf.

Results and Discussion

The Simmental cows were heavier, taller and gave more milk than the Polled Herefords (Table 24.1). Winter supplemental feeding and range stocking rate were based on metabolic weight (weight to the .75 power). Simmental cows consumed more energy for maintenance and milk production than the Polled Hereford cows. For each pound increase in daily milk production, weaning weight increased 10 lb. Simmental calves were heavier than Polled Hereford calves at all ages.

Steers on the accelerated program gained faster and were slaughtered younger than similar steers on the conventional program (Table 24.2). All steers were slaughtered at a similar quality grade. Simmental steers produced heavier carcasses with less backfat and larger loin eyes than Polled Hereford steers.

Although there was considerable variation in feed energy utilization in both breeds, the energy required to produce a pound of retail cuts was the same for both breeds and both management systems. This included energy required for cow milk production and maintenance, and energy consumed by the steer from weaning to slaughter. Across breeds, the faster gaining steers were significantly more efficient and produced more pounds of retail cuts of higher quality grade than slower gaining steers. When yardage, facilities, labor, and interest are also considered, the faster gaining steers and the accelerated program are favored.

Table 24.1. Cow Traits and Steer Preweaning Performance

Traits	Simmental	Polled Hereford
Cow traits		
No.	20	21
Cow wt. at weaning, lb	1364.0 ± 25.7[a]	1118.0 ± 24.4[b]
Ht. at weaning, in	52.2 ± 0.4[a]	48.4 ± 0.4[b]
Post calving condition score	4.1 ± 0.2[a]	4.4 ± 0.2[a]
Avg. daily milk production,lb	23.1 ± 1.1[a]	16.0 ± 1.0[b]
Age, yr	5.9 ± 2.4[a]	5.8 ± 3.3[a]
Energy for maintenance (1yr)[1]	3864.0 ± 53.0[a]	3297.0 ± 51.0[b]
Energy for milk (205 days)[1]	1591.0 ± 73.0[a]	1101.0 ± 70.0[b]
Calf traits		
Birth date	March 24 ± 17 days	March 29 ± 11 days
Birth wt, lb	91.7 ± 2.9[a]	81.4 ± 2.8[b]
May wt, lb	179.4 ± 6.8[a]	152.8 ± 5.9[b]
June wt, lb	258.7 ± 7.4[a]	207.0 ± 7.0[b]
July wt, lb	335.6 ± 9.2[a]	264.2 ± 8.8[b]
Aug. wt, lb	467.1 ± 11.4[a]	374.5 ± 10.8[b]
Sept. wt,lb	516.3 ± 11.8[a]	453.0 ± 13.1[b]
Oct. wt, lb	573.3 ± 13.8[a]	453.0 ± 13.1[b]
Oct. Ht., in	44.1 ± 0.3[a]	40.0 ± 0.3[b]

[ab]Value in the same sow with different superscripts are different (P<.05).

[1]Mcal of energy.

Table 24.2. Postweaning Steer Performance

	Simmental		Polled Hereford	
Management system	Accelerated	Conventional	Accelerated	Conventional
No. steers	10	10	10	11
Starting wt, lb	605 ± 19[a]	572 ± 20[a]	474 ± 19[b]	468 ± 18[b]
56 day wt	733 ± 22[a]	666 ± 22[b]	654 ± 22[b]	572 ± 21[c]
84 day wt, lb	856 ± 22[a]	740 ± 22[b]	723 ± 22[b]	645 ± 21[c]
113 day wt, lb	913 ± 20[a]	799 ± 20[b]	764 ± 20[b]	701 ± 19[c]
NE_m 113 days, Mcal	700 ± 4[b]	662 ± 4[b]	600 ± 4[c]	576 ± 4[d]
NE_g 113 days, Mcal	579 ± 8[a]	406 ± 8[b]	630 ± 8[c]	316 ± 8[d]
Slaughter wt, lb	1313 ± 27[a]	1335 ± 28[a]	991 ± 27[b]	1077 ± 26[c]
NE_m 113 days to Sl., Mcal	1049 ± 10[a]	1340 ± 10[b]	628 ± 10[c]	874 ± 10[d]
NE_g 113 days to Sl., Mcal	958 ± 15[a]	1252 ± 15[b]	531 ± 15[c]	825 ± 14[d]
Days fed	242	283	205	235
Slaughter age, days	466 ± 23	516 ± 20	429 ± 10	458 ± 13
Hot carcass wt, lb	803 ± 14[a]	793 ± 15[a]	606 ± 14[b]	636 ± 14[b]
Backfat, in.	0.34 ± 0.04[a]	0.37 ± 0.04[a]	0.59 ± 0.04[b]	0.52 ± 0.04[b]
Loin eye area, sq. in.	13.5 ± 0.4[a]	13.0 ± 0.4[a]	10.6 ± 0.4[b]	10.9 ± 0.4[b]
Yield grade	2.7 ± 0.1[a]	2.8 ± 0.1[ab]	3.4 ± 0.1[c]	3.2 ± 0.1[bc]
Quality grade[1]	4.75 ± 0.13[a]	4.84 ± 0.13[a]	5.02 ± 0.13[a]	4.72 ± 0.12[a]
Retail cuts, lb	548 ± 11[a]	537 ± 11[a]	396 ± 11[b]	422 ± 10[b]
Total energy per lb retail cuts,(Mcal/lb)	16.6 ± 0.4[a]	16.7 ± 0.5[a]	17.1 ± 0.4[a]	16.7 ± 0.4[a]

[abcd]Values in the same row with different superscripts are different (P<.05).

[1]4 = high Good, 5 = low Choice.