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Summary

Systems for managing weaned British-breed steer calves through winter growing, summer grazing, and finishing periods were studied over three years. Calves were winte red at two rates of gain: less than 1.00 lb/day (Slow) and approximately 2.00 lb/day (Fast), and then split for summer grazing from May to July (62 days; Short) or September (120 days; Long). Following the grazing period all steers were fed a common 90% concentrate finishing diet for 121 days (Short) and 127 days (Long) until it was visually estimated that the cattle had 0.4 inches of fat over the thirteenth rib. Extending the length of summer grazing decreased finishing gain and efficiency but increased final weight and total costs. Cattle that grazed corn stalks with a relatively low winter gain (.79 lb/day) compensated during the summer and experienced faster summer gains then those wintered at a higher rate. Steers that grazed for the full summer grazing period (120 days) had the greatest gain on grass, however most of the compensatory gain was achieved with the Slow winter growth cattle during the first 62 days of grazing. Cattle that were on grass for the Short grazing period had faster finishing gain and tended to be more efficient. Economically there were not differences when representative costs were used in calculating breakevens. The cattle that were wintered at a fast rate and pastured for the full summer period had a higher breakeven. Cattle wintered at a fast rate of gain should only be grazed in the spring and early

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summer when the quality of forage is high enough to support higher pasture gains, to be economically competitive with systems that have lower winter input costs.

Introduction

Numerous alternatives exist for feeding and managing weaned medium-frame steers to slaughter. Efficiency of beef production includes the total growing and finishing period. Often economics of production only considers a single part of the production systems. As a consequence one segment of the industry may make decisions based on maximum profit while they own or manage an animal that may adversely effect the profit of a subsequent owner, possibly causing overall economic efficiency to be lowered. For example, cost per pound of gain is usually lower when calves are wintered at a relatively fast rate of gain and consequently feedlot operators tend to want relatively fast gains so cost of gain will be relatively low. However, this may not be cost effective if the cattle are going to be grazed the following summer.

Range land comprises about 60% of western Nebraska land mass which produces high quality forages for cow-calf producers and yearling stocker operators. Historically many yearlings were grazed on the rangeland after they had been weaned and wintered on the ranch at a relatively slow rate of gain. As more cattle were moved to confinement feeding on higher energy rations questions arose about what the proper wintering gain for weaned calves is and what the proper length to graze yearlings with varied winter gain is. Tremendous quantities of crop residues such as cornstalks are available to winter calves and even though the winter gain is relatively low and cost per pound of gain is high, total winter cost of gain can be very low. Cattle subjected to periods of low energy intake normally exhibit compensatory growth during subsequent periods of adequate energy intake. Cattle that experience compensatory growth are also more efficient than comparable cattle grown on a higher energy ration. Because of compensatory gains, considerable gain can be put on light yearlings on grass at a very low cost which would lower the overall cost of production. Because of the low winter moisture in western Nebraska, cornstalk quality is relatively high throughout the winter, allowing low cost winter gains and long grazing.

The objectives of this research were to 1) evaluate the effect of winter management and length of summer grazing on subsequent finishing performance with medium-frame steers, and 2) economically evaluate these systems of production.

Procedure

Systems for managing crossbred, medium-frame steer calves were evaluated over three years, using 432 British crossbred steers averaging 527 lb. The steers were managed in a 2×2 factorial arrangement of treatments. Factors included: winter rate of gain (Slow at less than 1 lb/day, or Fast at 2 lb/day) and summer grazing season (Short for 62 days, or Long for 120 days).

The wintering period averaged 127 days with the Slow treatment, grazing cornstalks approximately 52 days of the winter season followed by the feeding of limited energy diets (approximately, 2.1% of body weight) consisting (DM basis) of 37.5% haylage, 37.5% corn silage, 23% dry rolled corn, and 2% supplement to maintain a daily gain (less than 1 lb/day) similar to that obtained on the cornstalks. Fast winter gaining cattle were placed in the feedlot and fed ad libitum amounts of the basal diet used for the Slow treatment. Wintering groups were randomly assigned by pen (10 pens per treatment) to either a Short (62 days) or Long (120 days) grazing season. Steers grazed pastures, primarily crested wheatgrass and native grass, from mid-May to mid-September. The steers were implanted at the start of the grazing season and reimplanted at the start of the finishing period with Synovex S. Free choice minerals were supplied during grazing.

Evaluation of economic analysis for each system included current costs for all inputs. Costs that were used to get the final breakeven prices and total costs are: processing and health costs $14, corn stalks $0.15/day, spring feed $0.45/day, yardage $0.25/day, interest 9.0%, summer grass $0.33/day, and final ration feed cost $.05/lb. Breakeven prices were used to evaluate the overall economic returns of each system.

Rumen fill differences after the grazing season were minimized by feeding a common diet of 50% corn silage and 50% haylage (DM basis) at 2.0% body weight for 3 days before weighing on two consecutive days to determine the final weight for the grazing season.

Steers were fed a common finishing diet for 121 days (Short) and 127 days (Long) until it was visually estimated that the cattle had 0.4 inches of fat over the thirteenth rib. After collecting carcass data, 84% had reached the Choice grade. The finishing diet consisted (DM basis) of 44% high moisture corn, 40% rolled corn, 10% roughage (corn silage and/or haylage), and 6% supplement. The supplement provided Rumensin and Tylan at 29 and 10 grams of ration dry matter, respectively. There were 4 step up diets containing 50%, 40%, 30%, and 20% roughage (DM basis) fed for approximately 15 to 20 days.

Data within in each year were analyzed by analysis of variance using the General Linear Models procedure (SAS, 1985). Experimental design was a completely randomized design with a 2 × 2 factorial treatment arrangement, with pen as the experimental unit. When the treatment × year interaction was determined not significant (P>.10), all three years were pooled for analysis.

Results

Total winter gains (Table 1) for the Slow and Fast wintering treatments were 98 and 242 lb, respectively (P<.10). Compensatory growth during summer grazing by the Slow winter group continued through and was greater during the last part of the grazing season (interaction, P<.10) than the Fast winter group (88 vs 65 lb). This was expected because the calves that were wintered at a Slow rate were carrying less body

Table 1. Steer performance in winter and summer management systems

Winter Gain Grazing Season	Slow Short	Slow Long	Fast Short	Fast Long
No. of Steers	109	107	108	108
Initial weight, lb	524	528	526	529
Winter				
Total gain, lb[a]	96	100	240	244
ADG, lb/d[a]	.78	.80	2.01	2.04
Summer				
Total gain, lb[b]	151	239	88	153
ADG, lb/d[b]	2.45	2.01	1.44	1.29

[a]Winter gain (P<.10).
[b]Winter gain x Grazing season (P<.10).

Table 2. Steer performance during finishing

Winter Gain Grazing Season	Slow Short	Slow Long	Fast Short	Fast Long
Finishing gain, lb[ab]	439	411	422	384
Finishing F/G[ab]	6.45	7.13	6.70	7.77
Finishing ADG, lb[ab]	3.69	3.28	3.55	3.06
Finishing DMI, lb	23.87	23.40	23.78	23.76

[a]Winter gain (P<.10).
[b]Grazing season (P<.10).

Table 3. Economic performance in management systems

Winter Gain Grazing Season	Slow Short	Slow Long	Fast Short	Fast Long
Final weight, lb[ab]	1211	1276	1277	1310
Total costs, $[abc]	827.67	872.86	865.72	914.23
Breakeven, $/100 lb[d]	69.85	69.94	69.27	71.41

[a]Winter gain (P<.10).
[b]Grazing season (P<.10).
[c]Costs assumed are: processing and health costs $14, corn stalks $0.15/day, spring feed $0.45/day, yardage $0.25/day, interest 9.0%, summer grass $0.33/day, and final ration feed cost $.05/lb.
[d]Winter gain x Grazing season (P<.10).

condition when turned out to grass and had more of an opportunity to gain body condition. In contrast, the cattle that were wintered at a Fast rate were carrying considerable more condition when turned out to grass and consequently had less opportunity to add weight through body condition. Total summer grazing gains during the Short grazing season were 151 and 88 lb for the Slow and Fast winter groups, respectively. Cattle on the Fast winter growth were 146 lb heavier (actual weight 770 lb) when going to pasture than the Slow growth cattle. At the end of the Long grazing season, the Slow winter growth cattle had gained within 59 lb of the Fast winter growth steers (867 vs 926 lb actual weight for the Slow and Fast winter growth, respectively). The cattle on the Slow winter growing program made up 59% of the winter weight gain difference. Total summer gains during Long grazing season were 239 and 153 lb for the Slow and Fast winter groups, respectively. Finishing feed to gain ratios (Table 2) were lower (P<.10) for the Short grazing season than for the Long (6.58 vs 7.45). The combination of Slow winter gains with Short season grazing resulted in the lowest finishing feed to gain ratio each year. The improvement in feed efficiency is primarily the result of improved gain during the finishing period. Apparently the Slow winter growth and Short grazing cattle still had some opportunity to exhibit compensatory gain. Also the cattle that were taken off of pasture at mid-summer were finished in more temperate weather and possibly better feeding conditions than those brought off of grass in mid-September and marketed in January.

Finishing dry matter intake was not different among the four systems (Table 2). Finishing ADG was higher (P<.10) for steers that were finished after the first half of the summer grazing season compared to those grazed for the Long season.

Total costs (Table 3) were lower (P<.10) for the Short season than for the Long season of grazing ($846.70 vs $893.55, respectively). Total final weight was increased for the Fast winter gain and Long grazing group (P<.10), however total costs were also increased and breakeven for this treatment was higher than for the other three treatments. Under the conditions that this trial was conducted and with the assumed costs, the breakeven was not different for the cattle that were wintered at a Slow rate of gain or those wintered at a Fast rate but only grazed until mid summer. Many factors could alter the breakeven value such as the cost and availability of stalks and the type and cost of summer forage. Perhaps a larger factor that influences profits is the price when cattle are marketed. Producers may use forages to extend the time of marketing cattle when seasonal prices are historically high. Breakevens can be lowered when low cost forages are utilized to grow cattle. This decrease in breakeven was primarily due to the increased weight when the cattle were slaughtered. In this trial, even though slaughter weight was a major factor in determining breakevens, the cattle that grazed for the entire summer were not heavy enough to offset the costs of achieving slaughter weight.

Conclusions

Opportunities exist for producers to take advantage of low input expenses for winter management, causing larger summer gains on pasture. Cattle wintered at a fast rate of gain should be grazed for a shorter period of time to be economically competitive with wintering systems that have lower input costs and gains before they are turned out to grass.

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