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Effects of starting weight, body condition, and age on gain of cattle grazing native grass

Abstract

In 29 trials over 10 years, 6,614 head of cattle (heifers - 11 trials, 2,862 hd; steers - 18 trials, 3,752 hd) were used to determine the effect of starting weight on gain while grazing burned, native-grass pastures. The heifers grazed for an average of 81 days (70 to 93) and steers for an average of 86 days (75 to 99) from April to July. Stocking rate was one animal per 2 acres. The cattle were sorted by starting weight into groups as follows: below 399 lb, 400 to 499 lb, 500 to 599 lb, 600 to 699 lb, and above 700 lb. In three other trials, 613 yearling heifers were sorted by starting weight, as shown above, and assigned a body condition score from 1 (thinnest) to 5 (fattest). A separate grazing trial was conducted in which 158 yearling steers were compared to 103 steer calves. The yearlings were spring born and wintered on wheat pasture; the calves were fall born. Lightweight heifers had the greatest daily gain. Heifers between 400 and 499 lb gained considerably more ($P < .08$) than heifers that weighed more than 600 lb. The steers with starting weights between 400 to 499 lb and 500 to 599 lb gained substantially more ($P < .01$) than other weight groups. Steers gained faster than heifers (2.29 lb vs 1.90 lb/day, $P < .01$). As heifers became fleshier, gain declined in all weight groups. Fall-born steer calves (444 lb) gained slower (2.45 vs 2.68 lb per day, $P < .01$) than spring-born yearling steers (587 lb). Based on these data, the optimum starting weight for stocker cattle is between 400 and 499 lb for heifers and between 400 and 599 lb for steers. Yearling steers gained better than calves. In conclusion, sex, age, and starting weight of cattle affect their gains while grazing burned, native grass pastures. The optimum weight for best pasture gain may vary by forage type and quality, but clearly there is an ideal weight range for stocker cattle used for grazing.

Keywords

Cattlemen's Day, 1999; Kansas Agricultural Experiment Station contribution; no. 99-339-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 831; Beef; Stocker; Starting weight; Grass

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**EFFECTS OF STARTING WEIGHT, BODY CONDITION,
AND AGE ON GAIN OF CATTLE GRAZING NATIVE GRASS**

F. K. Brazle¹ and J. Higgins²

Summary

In 29 trials over 10 years, 6,614 head of cattle (heifers - 11 trials, 2,862 hd; steers - 18 trials, 3,752 hd) were used to determine the effect of starting weight on gain while grazing burned, native-grass pastures. The heifers grazed for an average of 81 days (70 to 93) and steers for an average of 86 days (75 to 99) from April to July. Stocking rate was one animal per 2 acres. The cattle were sorted by starting weight into groups as follows: below 399 lb, 400 to 499 lb, 500 to 599 lb, 600 to 699 lb, and above 700 lb. In three other trials, 613 yearling heifers were sorted by starting weight, as shown above, and assigned a body condition score from 1 (thinnest to 5 (fattest). A separate grazing trial was conducted in which 158 yearling steers were compared to 103 steer calves. The yearlings were spring born and wintered on wheat pasture; the calves were fall born. Lightweight heifers had the greatest daily gain. Heifers between 400 and 499 lb gained considerably more ($P < .08$) than heifers that weighed more than 600 lb. The steers with starting weights between 400 to 499 lb and 500 to 599 lb gained substantially more ($P < .01$) than other weight groups. Steers gained faster than heifers (2.29 lb vs 1.90 lb/day, $P < .01$). As heifers became fleshier, gain declined in all weight groups. Fall-born steer calves (444 lb) gained slower (2.45 vs 2.68 lb per day, $P < .01$) than spring-born yearling steers (587 lb). Based on these data, the optimum starting weight for stocker cattle is between 400 and 499 lb for heifers and between 400 and 599 lb for steers.

Yearling steers gained better than calves. In conclusion, sex, age, and starting weight of cattle affect their gains while grazing burned, native grass pastures. The optimum weight for best pasture gain may vary by forage type and quality, but clearly there is an ideal weight range for stocker cattle used for grazing.

(Key Words: Stocker, Starting Weight, Grass.)

Introduction

Historically, considerable variability has occurred in the weight, sex, and kind of grazing cattle. However, there is little documentation on how starting weight, age and sex affect gain. Therefore, we compiled the records from many studies where cattle grazed native pasture to determine the effects of weight and sex on performance while grazing. Other studies were conducted to evaluate the effects of age and body condition on performance while grazing.

Experimental Procedures

To evaluate the effect of age on performance, 158 spring-born steer calves that had been wintered on wheat pasture and 103 fall-born calves out of the same cow herd (Limousin × Angus) grazed the same pastures for 93 days. Both groups were subject to a standard health and implant program.

To evaluate the effect of body condition and starting weight on performance, three

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studies were conducted using 602 yearling heifers that had been wintered together. They were condition scored (1 = thin, 3 = average, 5 = fleshy) and allotted to starting weights of 300 to 399 lb, 400 to 499 lb, 500 to 599 lb, and 600 to 699 lb.

To evaluate the effect of starting weight, 11 studies used 2862 heifers sorted into the following starting weight groups: 399 lb and down, 400 to 499 lb, 500 to 599 lb, 600 to 699 lb, and 700 lb and up. The heifers grazed burned native grass pastures for an average of 81 days.

To evaluate the effect of starting weight of steers, 18 studies were compiled in which 3752 steers were sorted into starting weights of: 399 lb and less, 400 to 499 lb, 500 to 599 lb, 600 to 699 lb, and 700 lb and up. The steers grazed for an average of 86 days.

In all studies, the health and implant programs were those typically followed with grazing cattle in the Flint Hills. The data were analyzed by SAS using weighted analysis of variance, where weight groups per study were weighted by reciprocal standard errors, and number of animals per weight group were used for calf vs yearling and condition studies.

Results and Discussion

Yearling steers grazing native grass pastures gained faster (2.68 vs 2.45 lb/day, $P < .004$) than calves (Table 1). Heifers that were average in body condition or a little thin gained faster than heifers with higher body condition (Table 2). Heifers that had both heavy starting weights and high body condition had poor weight gains on grass.

Pooling data from the 29 steer and heifer studies (Table 3) showed that steers typically gained faster than heifers (2.3 vs 1.9 lb/day, $P < .01$) while grazing native grass pastures. The best steer gains were in the groups that weighed 400 to 499 lb and 500 to 599 lb ($P < .01$; Table 2). Lighter and heavier cattle exhibited the poorest gains. However, body condition was not accounted for in this analysis. In general, the most desirable weight range for steers grazing native grass pasture for less than 100 days was between 500 and 599 lb. The most

desirable starting weight for heifers grazing native grass was between 400 and 499 lb (Table 5). When heifers were heavier, we saw a decline in gain, particularly when starting weights were over 700 lb. Based on these results, it is clear that weight, age, and condition of cattle can significantly affect their performance when grazing native grass.

Table 1. Grass Gains of Calves vs Yearling Steers

Item	Calves	Yearlings
No. head	103	158
Starting wt, lb	444	587
ADG, lb	2.45 ^a	2.68 ^b
Days	93	93

^{a,b}Means in the same row with unlike superscripts are different ($P < .004$).

Table 2. Effect of Weight and Condition on Heifers' Gains

Starting Wt, lb	Condition Score			
	2	3	4	5
300 to 399 ADG, lb	2.01	2.10	1.56	—
400 to 499 ADG, lb	2.12 ^a	2.18 ^a	1.96 ^{ab}	1.66 ^b
500 to 599 ADG, lb	2.15 ^a	2.01 ^a	1.89 ^a	1.11 ^b
600 to 699 ADG, lb	2.06 ^{ab}	2.08 ^a	1.68 ^b	.98 ^c

^{a,b,c}Means in the same row with unlike superscripts are different ($P < .08$).

Table 3. Pooled Gain Data by Sex

Sex	ADG, lbs
Steers/lb/day	2.3 ^a
Heifers/lb/day	1.9 ^b

^{a,b}Means in the same column with unlike superscripts are different (P<.0007).

Table 4. Effect of Steers Starting Weight on Gains on Native Grass (18 studies, 3,752 head, 86 days)

Starting Wt, lb	ADG, lb
399 9	1.77 ^c
400 to 499	2.77 ^a
500 to 599	2.62 ^a
600 to 699	2.39 ^b
700 8	1.95 ^c

^{a,b,c}Means in the same column with unlike superscripts are different (P<.01).

Table 5. Effect of Heifer Starting Weight on Gains on Native Grass (11 studies, 2,862 head, 81 days)

Starting Wt, lb	ADG, lb
399 9	2.09 ^{ab}
400 to 499	2.10 ^a
500 to 599	1.96 ^{ab}
600 to 699	1.82 ^b
700 lb 8 1	.53 ^b

^{a,b}Means in the same column with unlike superscripts are different (P<.08).