

CARRYOVER EFFECTS OF FESCUE ENDOPHYTE ON FEEDLOT PERFORMANCE OF STEERS

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Story in Brief

Seventy two Angus, Brahman-Angus and Angus or Simmental X Brahman-Angus, 13 to 19-month-old steers were used to study effects of fescue grazing on subsequent feedlot performance. Steers had been grazed from November to May on: (1) Kentucky 31 fescue (83 % endophyte infected), (2) Kentucky 31 (76 % infected) interseeded with a mixture of clovers, and (3) Endophyte-free Kentucky 31 fescue. Steers were removed from fescue pastures near Poteau in eastern Oklahoma on May 21, held for 6 days on ryegrass pastures and shipped to a feedlot in western Oklahoma. Steers were then fed for 117 days and slaughtered. Compared to steers from high endophyte fescue, steers previously grazed on endophyte-free pastures gained 25 lb. less ($P < .01$) during the 6-day period on ryegrass, shrunk 7 lb. more in transit to the feedlot, gained 11 lb. less in the feedlot from start to mid-point of feeding ($P < .07$), and gained 6 lb. less from mid-point to final weight. Total gain from termination of fescue grazing to slaughter favored steers from endophyte infected pasture by 49 lb. ($P < .07$). Gains of fescue-clover steers were not significantly different from endophyte-free steers. Except for carcass weight, carcass traits were not significantly affected by type of fescue previously grazed. Cattle previously grazed on endophyte infected fescue made significant compensatory gain during the first 49 days in the feedlot.

(Key Words: Growing Cattle, Fescue, Endophyte, Feedlot, Finishing)

Introduction

A number of trials have shown reduced pasture performance of cattle grazing endophyte infected fescue forage. Because many thousands of these cattle are shipped to high plains feedlots for finishing, information about carryover effects of the endophyte toxin on subsequent performance in the feedlot is extremely important. The object of this study was to evaluate cattle feedlot performance and carcass characteristics of steers with large differences in previous pasture performance due to endophyte infection from grazing fescue pastures.

Materials and Methods

Seventy two Angus, Brahman-Angus and Angus or Simmental X Brahman-Angus, 13 to 19-month-old steers were used to study effects of fescue grazing on subsequent feedlot performance. All steers had been raised at the Kerr Center near Poteau in eastern Oklahoma where the study was

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conducted. Steers had been grazed from Nov. 7, 1986 to May 21, 1987 on: (1) Kentucky 31 fescue (83 % endophyte infected), (2) Kentucky 31 fescue (76 % infected) interseeded with a mixture of clovers, and (3) Endophyte-free Kentucky 31 fescue.

Steers were removed from fescue pastures on May 21, hauled about 2 miles to a ryegrass pasture adjacent to shipping facilities and held for 6 days on ryegrass pasture. Steers were weighed off ryegrass at 5 PM, loaded directly onto trucks, and shipped during the night to the Henry C. Hitch Feedyard near Guymon in western Oklahoma. The 6-day holding period on ryegrass and nighttime shipping were used to minimize heat stress of steers from endophyte-infected pastures. On arrival at the feedyard, steers were put in their pen and rested until the following morning when they were individually weighed on electronic scales, had rectal temperatures taken and were given routine processing procedures for incoming cattle. Processing consisted of IBR-BVD-Lepto, BRSV, 7-way clostridial, injections of Vitamin A and copper, implanting with Synovex-S and deworming with ivermectin. Steers were then fed for 117 days on a high concentration finishing ration with high moisture corn, steam flaked corn and steam flaked wheat. All steers were slaughtered at Booker Packing Company, in Northern Texas about 50 miles from the feedlot.

Final weight off fescue on May 21 was taken after overnight withdrawal from feed and water. All other weights were taken unshrunk. Calculations of weight gain to the mid-point of finishing and to final finished weight were based on 4 percent pencil shrinks for mid-period and final weights. Final steer weights were taken individually on September 21. Steers were killed the following morning and graded early in the morning of September 23.

Results and Discussion

Initial shrunk weights off fescue pastures are shown in Table 1. Steers from infected fescue pastures weighed about 120 lbs. less than steers from fescue-clover or endophyte-free pastures. It is interesting that during the 6 day period when cattle were held on ryegrass pasture close to the shipping facility, steers previously grazing endophyte-free fescue gained 25 lbs. less ($P < .01$) than those previously on infected pasture or fescue-clover pastures. Because the shipping weight was taken without shrink, this suggests that steers previously grazed on infected fescue take on large fills when offered another more palatable forage. Steers from infected fescue also tended to shrink less in transit to the feedlot.

Steers from infected pastures continued to gain faster than the other treatments ($P < .02$) during the first 49 days on feed. From the time of removal from fescue grazing through the first 49 days of feeding, gains were almost identical for endophyte-free and fescue-clover steers (203 vs. 202 lb). Total gains during this same period for infected fescue steers was 246 lbs, showing (1) that effects of the endophyte in this study were not permanent and (2) that compensatory gain began almost immediately after removal from the infected fescue. Gains during the second half of the finishing period were similar for all three groups, suggesting that most of the compensatory growth occurred relatively early in the feeding period.

Body temperatures at the time of processing at the feedlot were similar for all groups, in contrast the elevated temperatures recorded for steers on infected pastures at the termination of the grazing study

Table 1. Weight gains and body temperatures through the finishing period of steers that had grazed fescue pastures.^a

	Treatments		
	Endophyte Infected Fescue	Infected Fescue & Clover	Endophyte Free Fescue
No. Steers	27	19	26
Weight off Pasture (May 21)	755 ^c	878 ^b	875 ^b
Gains			
On Ryegrass (May 21-26)	38 ^b	39 ^b	13 ^c
Shrink (May 26-28)	-30	-48	-37
Gains in Feedlot			
On Feed to July, 49 days	238 ^b	211 ^c	227 ^{bc}
July to Finish, 68 days	224	233	218
On Feed to Finish, 117 days	462	444	445
Ship to Finish, 118 days	432 ^c	396 ^b	408 ^b
Total Gain Off Fescue to Finish, 122 days	470 ^c	435 ^{bc}	421 ^b
Final Finish Wt.	1225 ^c	1313 ^b	1296 ^b
Body Temp on Feed (May 28)	101.8	101.7	101.6
Body Temp in July	103.7	103.4	103.5

^aLeast squares means.

^{bc}Means on the same line with different superscript letter differ (P<.05)

(Lusby et al., 1988). Ambient temperatures in Poteau on the morning steers were weighed off fescue approached 90 F with very high humidity while temperatures in Guymon the morning steers were processed into the feedlot were about 58 F with low humidity. Elevated temperature in endophyte infected cattle is apparently not caused by an infection but caused by a failure of the body temperature regulatory mechanism under heat stress. While affected steers could not maintain body temperature in the hot, humid eastern Oklahoma climate, they had little difficulty in cool, dry climate of the Oklahoma panhandle.

One steer from endophyte infected pasture showed a rectal temperature of 107.3 F at the time of removal from pasture. This steer was not shipped to the feedlot because managers felt he might not survive the stress of transportation. Steers from endophyte infected pastures showed the typical appearance of rough haircoats, increased respiration rate and general unthrifty appearance. Rectal temperatures at 49 days on feed were again similar across all treatments. All temperatures were higher than "normal" for cattle but were probably not atypical for steers on a full feed of high concentrate.

Carcass results are shown in Table 2. Carcass weights were significantly lighter for steers previously grazed on infected fescue reflecting lighter final live weights. Fat thickness over the rib and yield grades also indicated a slight increase in finish for treatments with the heaviest carcass weights. However, quality grade and ribeye areas were not affected by grazing treatments.

Table 2. Carcass traits of steers previously grazed on fescue pastures.^a

	Treatments		
	Endophyte Infected Fescue	Infected Fescue & Clover	Endophyte Free Fescue
Slaughter			
% KHP ^e	2.2	2.1	2.2
Quality grade (11=G+)	11.4	11.0	11.3
Hot Carc. Wt.	791 ^d	858 ^{bc}	833 ^b
REA (sq. in.)	12.9	13.6	13.0
Fat Thickness (in.)	.36 ^c	.44 ^b	.41 ^b
Yield Grade (in.)	2.69	2.88	2.97
Slaughter			
Quality Grade			
% G	48.2	57.9	52.0
% Ch	51.8	42.1	48.0
Yield Grade			
% #1	3.7	5.3	16.0
% #2	59.3	57.9	40.0
% #3	33.3	31.6	40.0
% #4	3.7	5.3	4.0

^aLeast squares means.

^{bcd}Means on a line with different superscript letters differ ($P < .05$).

^eKidney, heart and pelvic fat.

This study shows that although steers from infected pastures may go on feed at substantially lighter weights than steers from endophyte-free or fescue-clover pastures, there is considerable compensatory gain during the finishing period. If heat stress can be minimized during shipment to the feedlot and during processing, steers showing the effects of the endophyte can perform very well in the feedlot.