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Abstract

A total of 150 heifer calves grazing smooth bromegrass pastures were used to compare supplementation with 0.5% of body weight per head daily of corn or dried distillers grains (DDG) in 2014, 2015, 2016, 2017, and 2018. Daily gains of heifers supplemented with corn or DDG were similar ($P > 0.05$) in all years except 2018, when heifers supplemented with DDG had greater ($P < 0.05$) gains than those supplemented with corn.

Keywords

corn, distillers grains, grazing, smooth bromegrass, supplementation, stocker cattle, heifers

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L.W. Lomas and J.L. Moyer

Summary

A total of 150 heifer calves grazing smooth bromegrass pastures were used to compare supplementation with 0.5% of body weight per head daily of corn or dried distillers grains (DDG) in 2014, 2015, 2016, 2017, and 2018. Daily gains of heifers supplemented with corn or DDG were similar ($P > 0.05$) in all years except 2018, when heifers supplemented with DDG had greater ($P < 0.05$) gains than those supplemented with corn.

Introduction

Distillers grains, a by-product of the ethanol industry, have tremendous potential as an economical and nutritious supplement for grazing cattle. Distillers grains contain a high concentration of protein (25 to 30%), with more than two-thirds escaping degradation in the rumen, which makes it an excellent supplement for younger cattle. Recent advancements in the ethanol manufacturing process have resulted in extraction of a greater amount of fat; therefore, creating distillers grains that may contain less energy than corn. This research was conducted to compare performance of stocker cattle supplemented with corn or DDG at 0.5% body weight per head daily while grazing smooth bromegrass pastures.

Experimental Procedures

Thirty heifer calves were weighed on two consecutive days, stratified by weight, and randomly allotted to six 5-acre smooth bromegrass pastures on April 8, 2014 (423 lb), April 7, 2015 (438 lb), April 6, 2016 (408 lb), March 17, 2017 (416 lb), and March 20, 2018 (394 lb). Three pastures of heifers were randomly assigned to one of two supplementation treatments (three replicates per treatment) and grazed for 142, 182, 197, 173, and 177 days in 2014, 2015, 2016, 2017, and 2018, respectively. Supplementation treatments were ground corn or DDG at 0.5% body weight per head daily. The DDG used in this study contained 25% protein and 6% fat. Corn was estimated to contain 10% protein and a similar level of energy as DDG. Pastures were fertilized with 100 lb/a nitrogen and P_2O_5 and K_2O as required by soil test on February 21, 2014, March 11, 2015, February 17, 2016, February 14, 2017, and February 13, 2018. Pastures were stocked with 1 heifer/a and grazed continuously until August 28, 2014, October 6,

2015, October 20, 2016, September 6, 2017, and September 13, 2018, when heifers were weighed on two consecutive days and grazing was terminated.

Cattle in each pasture were group-fed ground corn or DDG in meal form in bunks on a daily basis, and pasture was the experimental unit. No implants or feed additives were used. Weight gain was the primary measurement. Cattle were weighed every 28 days; quantity of supplement fed was adjusted at that time. Cattle were treated for internal and external parasites before being turned out to pasture and later vaccinated for protection from pinkeye. Heifers had free access to commercial mineral blocks that contained 12% calcium, 12% phosphorus, and 12% salt.

Results and Discussion

Cattle gains and supplement intake are presented in Tables 1, 2, 3, 4, and 5, for 2014, 2015, 2016, 2017, and 2018, respectively. Grazing gains and supplement intake were 2.00 and 2.8 lb/head daily and 2.10 and 2.9 lb/head daily, 1.69 and 3.0 lb/head daily and 1.61 and 3.0 lb/head daily, 1.65 and 2.8 lb/head daily and 1.64 and 2.9 lb/head daily, 1.71 and 2.8 lb/head daily and 1.87 and 2.9 lb/head daily, and 1.49 and 2.7 lb/head daily and 1.67 and 2.7 lb/head daily for heifers supplemented with corn and DDG in 2014, 2015, 2016, 2017, and 2018, respectively. Gains and supplement intake of heifers supplemented with corn were similar ($P > 0.05$) to those of heifers that were supplemented with DDG in 2014, 2015, 2016, and 2017 which would suggest that protein was not limiting performance of heifers grazing these pastures, as heifers fed corn received a similar amount of supplemental energy but less supplemental protein than those fed DDG. However, in 2018, heifers supplemented with DDG had greater ($P < 0.05$) gains and resulted in more ($P < 0.05$) gain per acre than those supplemented with corn.

Table 1. Effects of supplementation with corn or dried distillers grains (DDG) on gains of heifer calves grazing smooth bromegrass pastures, Southeast Research and Extension Center, 2014

Item	Supplement	
	Corn	DDG
Number of days	142	142
Number of head	15	15
Initial weight, lb	423	423
Final weight, lb	706	720
Gain, lb	284	298
Daily gain, lb	2.00	2.10
Gain/a, lb	284	298
Total supplement consumption, lb/head	397	409
Average supplement consumption, lb/head per day	2.8	2.9

Table 2. Effects of supplementation with corn or dried distillers grains (DDG) on gains of heifer calves grazing smooth bromegrass pastures, Southeast Research and Extension Center, 2015

Item	Supplement	
	Corn	DDG
Number of days	182	182
Number of head	15	15
Initial weight, lb	438	438
Final weight, lb	746	731
Gain, lb	308	293
Daily gain, lb	1.69	1.61
Gain/a, lb	308	293
Total supplement consumption, lb/head	539	537
Average supplement consumption, lb/head per day	3.0	3.0

Table 3. Effects of supplementation with corn or dried distillers grains (DDG) on gains of heifer calves grazing smooth bromegrass pastures, Southeast Research and Extension Center, 2016

Item	Supplement	
	Corn	DDG
Number of days	197	197
Number of head	15	15
Initial weight, lb	408	408
Final weight, lb	733	731
Gain, lb	324	323
Daily gain, lb	1.65	1.64
Gain/a, lb	324	323
Total supplement consumption, lb/head	558	562
Average supplement consumption, lb/head per day	2.8	2.9

Table 4. Effects of supplementation with corn or dried distillers grains (DDG) on gains of heifer calves grazing smooth bromegrass pastures, Southeast Research and Extension Center, 2017

Item	Supplement	
	Corn	DDG
Number of days	173	173
Number of head	15	15
Initial weight, lb	416	416
Final weight, lb	712	739
Gain, lb	295	323
Daily gain, lb	1.71	1.87
Gain/a, lb	295	323
Total supplement consumption, lb/head	493	497
Average supplement consumption, lb/head per day	2.8	2.9

Table 5. Effects of supplementation with corn or dried distillers grains (DDG) on gains of heifer calves grazing smooth bromegrass pastures, Southeast Research and Extension Center, 2018

Item	Supplement	
	Corn	DDG
Number of days	177	177
Number of head	15	15
Initial weight, lb	394	394
Final weight, lb	658a	688b
Gain, lb	264a	295b
Daily gain, lb	1.49a	1.67b
Gain/a, lb	264a	295b
Total supplement consumption, lb/head	480	486
Average supplement consumption, lb/head per day	2.7	2.7