EFFECT OF POULTRY LITTER ON WEIGHT GAIN OF GRAZING STOCKER CATTLE

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Story in Brief

Two hundred eleven stocker heifers were used to study the effect of poultry litter as a supplement on summer gain. Cattle were fed supplements of corn only, corn plus cottonseed meal, or poultry litter, or were fed no supplement. The trial was conducted for 54 days from July 26 with cattle supplemented for 48 days. Treatment groups grazed separate pastures and were rotated between pastures weekly. Gains for control, corn only, corn plus cottonseed meal and corn plus poultry litter were 42, 49, 63 and 54 lb/head, respectively.

(Key Words: Poultry Litter, Stocker Cattle.)

Introduction

The commercial poultry industry in eastern Oklahoma produces significant amounts of poultry litter. This litter consists of manure, bedding and spilled feed. Environmental concerns and high feed prices prompt stocker cattle operators to consider poultry litter as a feed for grazing stocker cattle. Laboratory analyses show litter to generally average within the ranges of 20to 25% crude protein, 55 to 60% TDN, 20 to 25% ash with significant levels of calcium, phosphorus and other macro and trace minerals. A sample survey by Ruffin and McCaskey (1990) demonstrated large variations around averages of nutrient contents in 106 poultry litter samples. Smith et al. (1993) showed no benefit to feeding a supplement of poultry litter and corn to wintered stocker cattle on hay compared to supplements of corn only or corn and cottonseed meal. Ruffin and McCaskey recommend diets supplemented with 50:50 poultry litter:corn to improve animal performance. The objective of this research was to determine the value of poultry litter as a supplement ingredient when fed to grazing stocker cattle during summer.

Material and Methods

Two hundred eleven heifers, (510 lb average body weight), were individually identified with ear tags, weighed, dewormed with Ivomec Pour-on® (.5 mg ivermectin/kg BW), and randomly allotted to treatment groups. Treatment groups were fed six days per week. Supplements consisted of 1.9 lb corn, 2.5 lb corn and cottonseed meal or 3.8 lb. corn and poultry litter (Table 1). The corn and corn/CSM treatment was designed to provide approximately the same amount of supplemental energy while the corn/CSM and corn/litter treatments were designed to provide similar amounts of supplemental protein (Table 2). A control group was fed no supplement. Heifers were not implanted.

All feed groups received two lb corn daily for three days at the initiation of the trial to accustom the cattle to feeding. Groups were then fed their respective feed supplements for 48 days. Cattle were grazed in four separate pastures divided by an electric fence and rotated between pastures weekly. Final weights on the cattle were taken four days following cessation of supplemental

feeding during which time all groups were turned together. The trial was terminated due to drought. Pastures consisted of bermudagrass and other warm season grasses with significant ragweed infestation.

Multiple feed samples were collected twice during the trial. Treatment samples were composited and nutrient analyses were conducted by Livestock Nutrition Laboratory Services, Columbia, Missouri.

Results and Discussion

Average gains across treatment groups were lower than expected for unimplanted heifers due to drought and unexpected pasture weed contamination (Table 3).

Weight gain for cattle fed corn only did not differ from contols (P>.05). However, cattle fed the corn/litter mix gained at a faster rate compared to controls (P<.05). Cotton seed meal/corn fed cattle gained more weight during the 48 day trial compared to all other groups (P<.01).

The conversion of corn or other high starch feeds to gain for stocker cattle grazing summer grass is generally 10 or more lb of feed to one lb of gain (Lusby et al., 1982). Cattle receiving corn only supplementation in this trial required 13 lb feed per lb of additional gain, while CSM/corn fed cattle required 5.7 lb feed per lb of additional weight gain beyond that of controls. The significant improvement in supplement conversion by cattle receiving CSM/corn supplements over weight gains of other treatments was likely due to the effect of supplemental protein on forage intake and digestibility.

These data suggest a slight benefit from supplemental energy and or nitrogen from poultry litter. However, supplemental nitrogen from cotton seed meal was more effective in improving weight gain and supplement conversion. Either supplemental protein from litter was inferior to CSM protein, or forage intake was reduced by the greater amount of DM supplied by the corn/litter supplement.

Literature Cited

Lusby, K.S., et al. 1982. Okla. Agr. Exp. Sta. Res. Rep. MP-112:36.

Ruffin, B.G. and T.A. McCaskey. 1990. Feedstuffs 62 (15):13.

Smith, S.C., et al. 1993.. Okla. Agr. Exp. Sta. Res. Rep. P-933:160.

Table 1. Analysis of feed supplements.[a] (Dry matter basis)

Item	Corn only	CSM/ corn	Litter/ corn

Moisture, %	13.19	12.40	14.29
Crude protein, %	8.96	27.63	18.70
ADF, %	3.46	9.59	13.84
TDN, %	91.16	74.27	73.62
NEm, mcal/lb	1.08	.74	.73
NEg, mcal/lb	.69	.48	.47
Nitrogen,%	1.43	4.42	2.99
Calcium, %	.02	.14	1.82
Phosphorus, %	.24	.67	1.03
Magnesium, %	.15	.37	.43
Potassium, %	.89	1.26	1.77
Sodium, %	.01	.06	.18
Sulphur, %	.30	.22	.35
Iron, ppm	63.05	111.85	784.04
Copper, ppm	5.78	14.68	38.44
Manganese, ppm	9.25	20.33	355.32
Zinc, ppm	28.34	47.45	184.07

[a]Livestock Nutrition Laboratory Services, Columbia, MO.

Table 2. Daily supply of nutrients from supplement[a].

Item	Corn only	CSM/ corn	Litter/ corn
Daily feed, lbs	1.9	2.5	3.8
Crude protein, lbs	.15	.61	.61

TDN, lbs	1.5	1.6	2.4
Calcium, g	.15	1.4	26.9
Phosphorus, g	1.8	6.7	15.2

[a]Supplements were prorated for 6 days per week feeding.

Table 3. Effect of supplement on stocker gain.

	Number	Initial weight	Gain Conversion lb supp/lb added gain	Supplement
Control	53	517	[42a]	--
Corn only	53	499	49[ab]	13.0
Litter/corn	53	517	54[b]	15.2
CSM/corn	52	507	63[c]	5.7

[a,b,c]Values with different superscripts differ (P<.01).

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