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Effect of Pelleted Feed Products and Bambermycins on Performance When Fed to Cattle Grazing Residue

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Summary

Steer calves grazing non-irrigated corn residue were supplemented with a corn residue and by-product pellet at 0.3, 0.7, or 1.1% of BW. The pellet was formulated to deliver either 0 or 10 mg/steer daily of bambermycins (Gainpro). There was no interaction between bambermycins inclusion and level of supplementation. Likewise, there was no effect of bambermycins on ending BW or ADG. As level of supplement increased, both ending BW and ADG increased linearly.

Introduction

Due to increased conversion of pasture and range land to cropland during the last decade there is significant potential for grazing corn residue. Grazing corn residue increases grazing season length and decreases the amount of harvested forage that must be fed to cattle. Corn residue quality decreases as grazing progresses because the highly digestible portions are consumed first. Additionally, the CP content of corn residue is insufficient to meet the protein needs of a growing animal. Therefore, supplementation with protein and energy is beneficial to supplement cattle grazing residue should improve performance. Supplementation of growing cattle with pelleted distillers grains and alkaline treated corn stover has been shown to increase ADG when fed with a low quality forage source (2016 *Nebraska Beef Report*, pp. 36–37). Feed additives, such as ionophores, are also an option for increasing ADG of cattle grazing forage. Bambermycins (Gainpro®) is an antimicrobial feed additive that has been shown to increase ADG in forage diets. Feeding bambermycins has not been evaluated in steers grazing corn residue. Therefore, the objective of this study was to evaluate the effects of bambermycins inclusion and differing amounts of supplementing a corn residue and byproduct pellet

on performance of growing calves grazing non-irrigated corn residue.

Procedure

An 85-d corn residue grazing trial was conducted from November 5, 2014 to January 28, 2015 at the University of Nebraska-Lincoln Agricultural Research and Development Center near Mead, NE. Sixty crossbred steers (initial BW = 560 lbs; SD = 58) were evaluated in a 2 × 3 factorial design. The first factor was inclusion of bambermycins fed at either 0 or 10 mg/steer daily. The second factor was increasing amounts of pellet supplement at 0.3, 0.7, or 1.1% of BW. The pellet contained 21% CP and consisted of 54% corn stover treated with calcium oxide, 32% dried distillers grains, and 14% solubles (provided by Pellet Technology, USA Gretna, Neb.). A second pellet contained 10% supplement as a percentage of DM to provide supplemental vitamins, minerals, and, depending on treatment, bambermycins. This pellet was fed at 1 lb of DM/steer daily with the remaining amount of supplement provided in the primary pellet. Steers were limit-fed a diet at 2% of BW consisting of 50% alfalfa and 50% Sweet Bran® for 5 days to equalize gut fill. Steers were weighed 3 consecutive days and assigned randomly to treatments after being stratified by weight. Steers were gathered daily at 1130 and individually offered supplement via Calan gates for approximately 1 hour. Following supplement consumption steers were returned to graze dryland corn residue. All steers were implanted with 36 mg of zeranol (Ralgro®) on d 1 of the experiment.

Stocking rate was calculated using estimates of residue amount and grazing efficiency from previous research (2012 *Nebraska Beef Report*, pp. 11–12). Yield (202 bu/acre), estimated forage availability (8 lb/bu), and total acres (42 acres) were multiplied to determine an estimate of total available forage for the corn field. Estimated available forage was divided by esti-

mated DMI (10 lb/steer daily) of steers to determine the number of grazing days the field could support. Supplement amount was adjusted on d 28 and 56 by taking BW measurements and shrinking them 4% to determine interim BW.

Ending BW was determined similarly to initial BW. Steers were limit fed a 50% alfalfa 50% Sweet Bran diet at 2% of BW for 5 consecutive days and weighed 3 days thereafter. Ending BW was calculated by averaging the 3 day weights.

Performance (BW and ADG) data were analyzed using the GLIMMIX procedure of SAS (SAS Institute, Inc., Cary, N.C.) with steer as the experimental unit. One steer was removed from the study due to issues unrelated to the experiment.

Results

There was no interaction between inclusion of bambermycins and pellet supplementation for ending BW or ADG ($P > 0.82$). Similarly, there was no main effect of bambermycins inclusion on ending BW or ADG ($P > 0.90$; Table 1) when fed at 10 mg/steer daily. There was a linear increase ($P > 0.01$) for ending BW and ADG as pellet supplementation increased (Table 2). For steers receiving supplement at 0.3% of BW, ADG was essentially 0 (–0.02 lb/d) which resulted in an ending BW that was 2 lb less than the initial BW. For steers supplemented at 0.7 and 1.1% of BW, ADG was 0.62 and 1.24 lb/d, respectively. The lack of BW change in steers supplemented with pellet at 0.3% of BW would indicate steers were being fed at maintenance requirements. This result was unexpected and would suggest that calves were significantly deficient in protein and/or energy. Metabolizable protein has been shown to increase gains in steers grazing corn residue (2016 *Nebraska Beef Report*, 31–32). The increased levels of protein provided by pellet to steers fed at greater levels likely contributed to the linear response in gain. It can also be assumed that the protein and

Table 1. Main effect of Gainpro on performance of growing cattle grazing corn residue

Gainpro Inclusion	Gainpro ^a	No Gainpro	SEM	P-Value
Initial BW, lb	561	560	11.3	0.93
Ending BW, lb	613	612	11.6	0.91
ADG, lb/d	0.61	0.61	0.04	0.93

^aProvided bambermycins at 10 mg/steer daily.

Table 2. Main effect of supplementation amount on performance of growing cattle grazing corn residue

Supplement ^a , % BW	0.3	0.7	1.1	SEM	P-Value	
					Lin ^b	Quad ^c
Initial BW, lb	558	565	559	14	0.95	0.71
Ending BW, lb	556 ^d	617 ^e	664 ^f	14	< 0.01	0.68
ADG, lb/d	-0.02 ^d	0.62 ^e	1.24 ^f	0.05	< 0.01	0.89

^aCaO treated corn residue (54%), dried distillers grains (32%), and solubles (14%).

^bLinear contrasts for supplement level.

^cQuadratic contrasts for supplement level

^{d,f}Means within a row with differing superscripts are different ($P < 0.05$).

energy levels available to steers supplemented at 1.1% of BW did not maximize gain, as the increase in ADG was identical between supplementation amounts (ADG of 0.62 and 0.64 between 0.3 and 0.7% of BW, and 0.7 and 1.1% of BW, respectively), suggesting that the point of diminishing return has not been met. Use of a corn-residue based pellet increased performance as supplementation increased; however, due to the nutrient deficiencies inherent to corn residue, greater amounts of protein

and/or energy may be beneficial for growing calves.

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