Effect of Bovatec® Level in Supplemental Feed on Performance and Forage Utilization Characteristics of Wintering Beef Cattle[1,2]

R.C. Cochran, L.R. Corah, K.A. Jacques, T.B. Avery[3], K.O. Zoellner, and J.F. Higginbotham[4]

Summary

Various levels of lasalocid (Bovatec®) added to a protein supplement did not improve weight or condition change of beef cows grazing poor quality winter pasture. Similarly, calf birth weight and most forage utilization characteristics (e.g., intake, passage rate, and fermentation characteristics) were not altered by Bovatec level. Although forage digestibility was influenced by Bovatec level, changes were not sufficient to influence performance characteristics.

Introduction

Improved rate of gain for pasture cattle receiving Bovatec® has been well documented. However, there is little information on Bovatec use with poor quality forages especially with grazing, pregnant, beef cows. Therefore, we evaluated performance and forage utilization when Bovatec was added at different levels to a protein supplement fed to wintering beef cattle.

Experimental Procedures

Three trials were conducted during the winter of 1985/86 at Kansas State University's Cow-Calf Unit. In trial 1, 120 pregnant beef cows received either 0, 100, 200 or 300 mg Bovatec/hd/d in 4 lb of 20% crude protein range cubes (principal components: cottonseed meal, wheat middlings, and corn). Ten cows from each treatment were assigned to each of three dormant, tallgrass-prairie pastures. Cattle were gathered each morning, separated into treatment groups and bunk-fed the appropriate supplement, beginning in mid-December and continuing until calving. Cow weight and body condition were recorded at trial initiation and after calving. Body condition scores were the average of two independent observers' scores and were estimated by palpation over the ribs and thoracic vertebrae. The scoring system ranged from 1 (extremely emaciated) to 9 (extremely obese).

[1]The expert assistance of Mr. Gary Ritter and Mr. Wayne Adolph is acknowledged and appreciated.

[2]Appreciation is expressed to Hoffmann-LaRoche (Nutley, NJ) and Ralston Purina (St. Louis, MO) for financial assistance and research product, respectively.

[3]Dept. of Surgery and Medicine.

[4]Dept. of Nuclear Engineering.

In trial 2, 40 pregnant beef cows (one full replication of trial 1) and 12 esophageally-fistulated beef steers were used to evaluate the influence of Bovatec level on intake and digestibility of winter forage. Supplements were the same as in trial 1 except that all supplements were labeled with ytterbium chloride. Supplements were fed individually for 14 days, and during the final 7 days, fecal samples were collected daily from all animals.

Esophageally-fistulated steers were used to collect samples of grazed forage on four separate occasions during the 7-day fecal collection period. Ytterbium concentrations in fecal samples were used to determine fecal output, whereas the ratio of indigestible acid detergent fiber in esophageal and fecal samples was used to determine digestibility.

In trial 3, 16 ruminally-fistulated steers were used to evaluate the influence of Bovatec level on the rumen fermentation of tallgrass-prairie forage. Cobalt EDTA was used to follow liquid digesta passage.

Results and Discussion

Bovatec level had no effect ($P>.10$) on total weight change and calf birth weight (Table 33.1). Cows lost an average of 121 lbs from mid-December through 48 hours postcalving. Calf birth weights averaged 79.5 lbs. Similarly, Bovatec did not influence ($P>.10$) changes in body condition scores (average change, -.85). Since cows entered the trial with an average body condition score of 5.5, they were below the minimum score of 5 at calving, which has been described as necessary for a prompt return to estrus.

Forage organic matter intake averaged 1.5% of body weight and was not affected ($P>.10$) by added Bovatec (Table 33.1). Forage organic matter digestibility was slightly depressed ($P<.01$) at the 100 mg level of Bovatec but increased thereafter, so that digestibility on the 300 mg level was similar to that for controls. Individual volatile fatty acids (VFA) and total VFA production, as well as ammonia (NH_3) and pH values, were unaffected ($P>.10$) by Bovatec level (Table 33.2). However, liquid flow through the digestive tract tended ($P=.10$) to follow the same pattern as that for organic matter digestibility.

Adding Bovatec to a 20% crude protein supplement did not improve the performance of pregnant beef cows grazing winter bluestem range. Similarly, intake of forage organic matter was not influenced. Although forage organic matter digestibility varied with Bovatec level, the difference was too small to influence weight or condition change. Ruminal fermentation and fluid flow characteristics were not altered by Bovatec level.

Table 33.1. Effect of Bovatec Level on Weight Change, Condition Change, Forage Organic Matter (OM) Intake, and Digestibility of Pregnant Beef Cows and Birth Weight of Calves

Item	Bovatec Level (mg/head/day) 0	100	200	300	SE[a]
Initial weight (lbs)	1038	1030	1034	1047	22
Final weight (lbs)	913	920	911	922	--
Weight loss (lbs)	-125	-110	-123	-125	11
Initial condition score	5.7	5.5	5.4	5.6	.1
Final conditon score	4.8	4.5	4.7	4.8	.1
Change in condition score	-.9	-1.0	-.7	-.8	.2
Forage OM intake (% body wt)	1.55	1.61	1.54	1.49	.1
Forage OM digestibility (%)[b]	36.2	32.2	33.3	38.9	1.2
Calf birth weight (lbs)	79	81	80	78	2

[a]Standard error.
[b]Quadratic response with increasing level of Bovatec (P<.01).

Table 33.2. Influence of Bovatec Level on Ruminal Fluid Flow and Fermentation Characteristics in Ruminal-fistulated Beef Steers

Item	Bovatec Level (mg/head/day) 0	100	200	300	SE[a]
Dilution rate (%/h)	8.09	7.91	8.20	7.66	.58
Ruminal volume (l)	47.63	74.74	54.81	49.64	9.63
Digesta flow rate (l/h)[b]	3.87	5.91	4.49	3.80	.66
pH	6.57	6.49	6.49	6.59	.05
NH_3-N (mM)	2.06	2.18	2.31	3.46	.80
Total VFA (mM)	79.04	75.79	81.60	81.75	4.75
	VFA Molar Percentage				
Acetate	71.03	71.34	70.56	70.39	1.01
Propionate	18.40	19.56	19.68	19.73	.91
Butyrate	8.75	7.43	8.07	7.99	.48
Isobutyrate	.55	.51	.50	.62	.07
Valerate	.76	.68	.69	.63	.05
Isovalerate	.51	.48	.50	.64	.11
Acetate:Propionate	3.88	3.70	3.61	3.60	.21

[a]Standard error.
[b]Quadratic response with increasing Bovatec (P=.10).