

Efficacy of BGY28 on the Performance of Newly Weaned Calves Fed a High Fiber Diet during an Initial 83-Day Feeding Period

ABSTRACT

Fifty (50) newly weaned steer calves (average 615 lbs) were purchased in Fairview, Illinois and fifty (50) newly weaned steer and heifer calves from a local beef herd in Muscatine, Iowa (average 615 lbs) were allotted to one of 20 confinement, slotted floor pens on October 24, 2014 based on sex, origin (sale barn versus local Iowa farm) and body weight. Treatments were assigned to blocks of five pens (5 head/pen) throughout the barn in a randomized complete block design. Treatments evaluated were: Control (no additives) or BGY28 (2oz/hd/day). Upon arrival, all cattle received a full feed of long-stemmed grass hay for two (2) days and four (4) pounds of a base feed formulated to meet the ingredient specifications of a high fiber back grounding diet, used predominately in the southeastern regions of the United States, along with their assigned feed additive(s). At day zero (0), calves were switched to a diet which contained three (3) pounds of processed grass hay, ad libitum high fiber meal diet and their assigned feed additive(s). Feed additives were provided individually on a daily basis and mixed within their total mixed ration (TMR).

The basal meal diet was supplemented with a starter premix from day 1 through day 27 of the study whereupon that premix was replaced by a grower premix and fed until the trial's termination on day 83. These premixes contained protein, macro and micro minerals and vitamins and were added to the TMR at the mixer.

Introduction

Yeast products have been used for many years in receiving cattle diets in hopes of increasing feed intake, gain and feed efficiency, while improving overall cattle health.

BGY28 (F.L. Emmert Company, Cincinnati, OH) is a brewer's yeast supplement, which is a combination of proprietary proteins, amino acids and minerals specifically blended and processed to stimulate performance and improve health in animals. Unpublished data from F.L. Emmert Co. compared BGY28 to a standard yeast culture and demonstrated that receiving calves gained more rapidly and 18% more efficiently than those on the standard yeast program. Sachtleben and co-workers (2004) reported that the feeding of BGY28 tended ($P > 0.05$) to stimulate dry matter intakes (DMI) of newly arrived feeder calves (495 lbs).

In vitro research conducted for F.L. Emmert Co. by independent labs (unpublished data) demonstrated that BGY28 stimulated ($P < 0.08$) dry matter

digestion, NDF digestibility and in vitro true digestibility at 24 hour fermentation compared to the control TMR samples during this same time period. In the same trial, BGY28 when fed at the 2 ounce rate was superior ($P < 0.01$) to Diamond V XP when examining the same parameters.

The objective of this investigation was to evaluate the performance of newly weaned beef calves (615 lbs), while being fed a back grounding, high fiber meal diet with limited processed hay in a TMR. Treatment(s) added to this TMR were: Control (no additive) or BGY28 (2oz/hd/d).

Material and Methods

One hundred (100) recently weaned crossbred beef calves (50 from Fairview, IL sale barn and 50 from a local beef herd in Muscatine, IA) were allotted on October 24, 2014 into 20 confinement, concrete slotted floor pens at an independent research and development center in Iowa. Assignments to pens were made based on weight (average 615 lb), origin (sale barn versus local Iowa farm) and sex. All calves were given vaccinations and implanted with a TBA type implant, as standard protocol from the independent research facilities guidelines. Cattle were deloused and de-wormed on allotment day. Treatments as outlined below were assigned to the 20 pens.

Treatment	Description
1	Control, No Additives
2	BGY28, 2oz/hd/day

Basal diets were formulated to mimic the ingredients and amounts of a back ground diet typically fed in southeastern regions of the United States (see Table 1). Dietary ingredients in this meal feed, in addition to the 3 pounds of ground hay, provided a diet which was high in fiber and low in net energy. A starter premix was added to the starter feed offered from day 1 through day 27 in order to provide necessary protein, trace minerals, macro minerals and vitamins. The starter premix contained chelated trace minerals (Zinpro Corp, Eden Prairie, MN) and chromium propionate (Kemin, Industries, Des Moines, IA). From day 28 through 83 cattle were fed a grower premix within the TMR that did not contain the chelated minerals or chromium propionate. All treatment additives as outlined above were added individually to the TMR at the facilities' stationary mixer. Cattle were fed once daily in a trough bunk system and weigh backs were recorded as needed.

All calves were weighed individually on days 0, 13, 27, 55 and 83. Health records were maintained on an individual animal basis. Calves were pulled for treatment if they exhibited lethargy, gauntness, a lowered head, drooped ears, or lack of appetite and were given an injectable medication if body temperature exceeded 103 degrees (F).

All feedlot data were subjected to a two way analysis of variance with the treatment means separated by LSD methods (Statistix, 2005). Hypothesis were accepted and rejected at $P < 0.05$.

Results and Discussion

The feedlot performance data for the initial 27 days (day 0-27) are summarized in Table 2. No significant differences occurred ($P > 0.10$) during the 0-27 day portion of the trial, with feed intake fairly consistent across treatments. However, although not significant, the BGY28 treatment group recorded numerical advantages in ADG, DMI, and F/G compared to that of cattle from the control (no yeast additive) group during the initial growth phase (day 0-13) and during the second growth phase (day 14-27). Overall, initial 27 day feedlot performance data determined calves fed BGY28 gained faster, had greater DMI and improved feed efficiency when compared to calves fed the control diet.

Table 3 summarizes the growing calf data (day 28-83) as well as the overall start-grow 83 day cumulative performance numbers. From day 57-83 of the trial, ADG of cattle tended to go backwards as a total group during these 28 days, however intake was numerically greater than the previous 28 days. This portion of the trial would have coincided with the dates of December 18 through January 15, 2015; a very cold portion of Iowa's winter. During this time, a greater portion of the diet would have gone to the maintenance requirement of the calf rather than toward gain. These meal diets (Table 1) calculated to about 38.0 Mcal/cwt NEg. This value is very low, but typical of high fiber back grounding diets in southeastern regions of the United States; however, incapable of supporting high growth potential in cold weather or in situations where maintenance requirements increase. Overall, from day 28 to the end of the study (day 83), cattle performance data was similar ($P > 0.10$) among treatment groups, with the numerical advantage of feeding BGY28 appearing only in the initial phase (day 0-27) of the study.

Results from this study report cattle supplemented with BGY28 had a numerical advantage in their ADG, DMI and F/G during the initial receiving phase when compared to cattle not supplemented (control: no additive). These results confirm previous findings by the F.L. Emmert Company, who reported positive responses in cattle fed BGY28 during the receiving phase. Additional research continuing to evaluate high grain versus high fiber, receiving versus finishing, and F.L. Emmert Company's BGY28 product versus other brewers yeast products on the market will continue.

Summary

The data from this study indicate that the use of BGY28 can be beneficial in the initial receiving phase of the feedlot period. Increased DMI often leads to improvements in rate of gain, with F/G also improving. Data reported numerical increases in the BGY28 treatment group in stimulating DMI and improving ADG and F/G in newly weaned calves in the feedlot during the initial receiving phase (day 0-27), but numerical improvements were lacking during the final phase (day 28-83). Overall, data indicates improvements during the initial receiving phase when supplementing cattle with BGY28.

Table 1: Basal Diet and Feed Additive Treatments

Ingredient, #/Ton	Treatment	
	1	2
Corn Gluten Feed	600	600
Rice Hulls	420	420
Rice Bran	125	125
Soy Hulls	400	400
Cracked Corn	225	225
Cottonseed Hulls	90	90
Limestone	40	40
Starter or Grower Px	100	100
	2000	2000
Calculated Nutrient Analysis (As Fed)		
Crude Protein, %	13.40	13.40
Calcium, %	1.40	1.40
Phosphorus, %	.45	.45
NE_m, Mcal/Lb	.65	.65
NE_g, Mcal/Lb	.38	.38
Potassium, %	.94	.94
Sulfur, %	.19	.19
Selenium, ppm	.30	.30

Table 2: Effect of BGY28 on the Performance of Newly Weaned Feeder Calves (0-27 Days)

Treatment	Description	Days	ADG, Lb	DMI, Lb	F/G
1	Control	0-13	2.10	13.67	6.62
2	BGY28	0-13	2.67	13.67	5.67
1	Control	14-27	2.77	19.01	7.20
2	BGY28	14-27	3.04	19.76	6.83
1	Control	0-27	2.45	16.43	6.87
2	BGY28	0-27	2.86	16.82	5.89

¹No brewers yeast additive.

²F.L. Emmert Company brewers yeast additive, fed at 2oz/hd/d.

Table 3: Effect of BGY28 on the Performance of Newly Weaned Feeder Calves (28-83 Days)

Treatment	Description	Days	ADG, Lb	DMI, Lb	F/G
1	Control	28-56	3.70	23.71	6.42
2	BGY28	28-56	3.74	24.78	6.68
1	Control	57-83	2.76	25.73	9.62
2	BGY28	57-83	2.48	27.03	10.99
1	Control	0-83	2.98	22.02	7.43
2	BGY28	0-83	3.03	22.95	7.59

¹No brewers yeast additive.

²F.L. Emmert Company brewers yeast additive, fed at 2oz/hd/d.