An Evaluation of Cellulo-Gest™ Supplement to Enhance Forage Digestibility and Improve Performance of Growing Calves

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Introduction

A number of different feed additives that are advertised to improve animal performance have been promoted. The products proven to be effective in unbiased research give cattle feeders economic options for natural (yeasts, enzymes, and microbial products) and conventional (ionophores, beta agonist) markets. Some new products are combinations of ingredients that can improve animal performance by increasing forage digestibility. This study is an evaluation of Cellulo-Gest, Old Mill-Troy Inc., North Troy, VT, fed in mixed rations to growing feedlot cattle.

Procedures

Weaned steer calves (n=172) consigned by the Central Dakota Feeder Calf Show from 32 different ranches were used in this study. Prior to the initiation of the study, calves were vaccinated with Pyramid 5 with Presponse (viral vaccine), Bar Vac 7 with Somnus (clostridial complex), and Nasalgen (TSV2 and PI3). Calves were implanted with Ralgro and a metaphylactic antibiotic Zuprevo was injected prior to shipment to the Carrington Research Extension Center feedlot. Calves were weighed individually, and randomly allotted by weight block into one of 16 pens with 10 or 11 head per pen. The study started on October 26, 2012, and concluded on January 16, 2013.

Supplements were prepared at the Northern Crops Institute feed mill (NDSU, Fargo, ND) and contained the ionophore Rumensin® (Elanco Animal Health, Greenfield, IN) at 300 mg/hd/d plus vitamin and mineral supplement. The enzyme additive evaluated in this study was Cellulo-Gest from The Old Mill-Troy, Inc., North Troy, VT. The product contains calcium carbonate, fermentation extracts of *Aspergillus oryzae* and *Aspergillillus niger*, dextrose, lactose, cobalt carbonate, mineral oil and natural flavorings. The enzyme product was included in the treatment supplement at 4 grams per head per day at a cost of $0.04.

A totally-mixed ration was offered daily to appetite based on morning bunk readings (Table 1). The main dietary forages were corn silage and switchgrass hay. The switchgrass hay was tub ground between 2 and 4 inches in length. Harvested just after heading, the hay was 9.26 percent crude protein, 43.45 percent ADF and 74.2 percent NDF. Calves were bedded equally with wheat straw during inclement weather and windbreaks were provided in each pen. Dry matter intake, average daily gain and feed efficiency were calculated for each weigh period and summarized over the entire trial. Economics were determined based on differences in feed intake, gain, and feed efficiency for the entire feeding period. This study was approved by the NDSU Institutional Animal Care and Use Committee.

Table 1. Ration formulations for growing steers fed Cellulo-Gest (%, DM basis).

Feedstuff	Control	Cellulo-Gest
Suppl. w/ionophore	2.5	2.5
Coccidiostat[1]	0.2	0.2
Corn, dry rolled	23.4	23.4
Barley, dry rolled	12.8	12.8
Modified dist grains	21.2	21.2
Switchgrass hay	11.9	12.0
Corn silage	27.9	27.9
DMI, lb/hd/d	23.42	23.58
Crude Protein, %	13.55	13.55

NEg, Mcal/cwt	52	52

[1] Decoquinate, brand name Decoxx, Alpharma, LLC, Bridgewater, NJ

Results

Dry matter intake was generally higher (average of 23.5 lbs/hd/d) than predicted by 1996 NRC (20.4 lbs /hd/d) for steers in this weight range. This was approximately 115 percent of predicted intake. As a result, gains were greater than expected. Dry matter intake (Table 2) was not affected by treatment (*P* = 0.73). Control steers ADG was 3.87 lbs for the entire 84-day feeding period, while Cellulo-Gest steers gained 4.04 lbs. This was a 4.4 percent improvement in ADG. Steers on the enzyme supplement gained numerically more than control steers each period. For the entire feeding period, ADG was greater (*P* = 0.09) indicating the enzyme supplement had a positive effect. Feed to gain (DM/gain) tended to favor the enzyme supplement at 5.84 vs. 6.03 (DM/gain) for the control (*P* = 0.12), a 3.2 percent improvement.

Table 2. Performance of growing steers fed Cellulo-Gest.

	Control	Cellulo-Gest	St Err	P-Value
Number of pens	8	8		
Number of steers	86	86		
Initial wt.	613.5	606.2	5.09	0.25
Avg. daily gain, lbs	3.87	4.04	0.07	0.09
Dry matter intake, lbs	23.42	23.58	0.41	0.73
Feed efficiency, DM/gain	6.03	5.84	0.09	0.12

The supplement cost $0.04 per head per day. If live weight is valued at $1.25 per pound, and ADG is 0.17 lbs more for the supplement, a net return to feeding the supplement is calculated at $0.17 per head per day. With this calculation, net profit increased $14.49 per head for the 84-day feeding period.