EFFECT OF REP-GEL ON PERFORMANCE OF SHIPPING STRESSED CATTLE

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Story in Brief

Rep-Gel is a commercially available orally administered paste consisting of amino acid chelated minerals and vitamin E. Effects on the performance of newly received, stressed cattle were studied in four 28-day receiving trials, using three hundred and thirty four newly received heifer, steer and bull calves. Upon arrival, cattle were sorted randomly into pens and each pen was allotted to a protein supplement and a Rep-Gel treatment. Cattle were processed using either routine processing (control), or routine processing plus Rep-Gel. Daily gains were 1.47 lbs/head for control cattle and 1.32 lbs/head for the cattle receiving Rep-Gel. Feed efficiency (feed/gain) was decreased by 12% with Rep-Gel (8.91 vs. 7.84) during the 28 day trial. In vitro studies were conducted with Rep-Gel at four different concentrations (none; .25 times recommended dosage; 1 times recommended dosage; 4 times recommended dosage.) All concentration levels containing Rep-Gel depressed dry matter digestibility of the prairie hay (46.0, 19.9, 19.8 and 16.5% respectively).

(Key Words: Cattle, Rep-Gel, Feed Efficiency.)

Introduction

Cattle with various nutritional backgrounds are shipped into Oklahoma every year. Because veterinarians report that sick cattle usually are deficient in selenium, copper and zinc, supplemental trace minerals should prove useful. Rep-Gel provides one day's requirement for minerals in a chelated form. According to the label, Rep-Gel contains magnesium amino acid chelate, potassium complex, zinc amino acid chelate, manganese amino acid chelate, copper amino acid chelate, sodium selenite, vitamin E (di-alphatocopherol acetate), food starch, gaur gum, maltodextrin, sodium saccharin, methyl paraben, and molasses flavoring. By providing these trace elements at processing the manufacturers theorized that the incidence of

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morbidity would be decreased and performance would be increased. The purpose of this study was to determine if animal health and performance was improved by dosing newly arrived cattle with Rep-Gel.

Materials and Methods

Four truck loads of cattle (334 heifer, steer and bull calves; 463 lb) were delivered to the Pawhuska Research Station. Upon arrival, all cattle were allowed free access to long stem hay and water overnight. The next day, calves were sorted randomly to pens. Pens were allotted to a protein source and a Rep-Gel treatment. Animals were weighed individually, identified, and processed. All calves were vaccinated with IBR-PI3 (modified live virus; i.m.), and a 7-way clostridial bacterin and injected with Ivermectin. Routine processing was considered to be the control; the Rep-Gel treatment consisted of routine processing plus Rep-Gel administered orally during processing once at a rate of 10cc per 200 pounds of body weight.

Protein supplements consisted of soybean meal (SBM), soybean meal plus blood meal (BM), milo distillers dried grain plus urea plus blood meal and milo distillers dried grains plus blood meal (Table 1). All diets were formulated to be isocaloric (NEg 50 Mcal/cwt) and isonitrogenous (15.3% CP) and contained 28% roughage. Cattle were adapted to diets over a 5-day period by sequentially decreasing the amount of hay fed. Diets were limit fed for 28 days to produce a maximum daily gain of 2.0 lb.

Cattle were weighed on day 14 and on day 28 of the trial after being held overnight without feed or water. During the trial, cattle were visually monitored twice daily for signs of sickness. Cattle displaying visual signs of sickness, depressed activity and feed intake, were moved to the processing area where rectal temperatures and severity of illness were clinically appraised and recorded. Animals with rectal temperatures $>104^{\circ}F$ were considered to be sick. Sick animals were treated with antimicrobial drugs. If rectal temperature decreased within 48 hours, treatment was terminated. If no improvement in temperature or visual signs were apparent within 48 hours, a different antimicrobial drug was administered. This procedure was continued until health was restored.

In vitro studies were conducted in triplicate with ground prairie hay and ruminal fluid freshly collected from a ruminally cannulated steer fed prairie hay. Dry matter digestibilities were calculated using the in vitro procedures of Tilley and Terry (1963).

Table 1. Composition of diets (dry matter basis).

Ingredient	SBM	SBM+BM	DDG+ Urea+BM	DDG+BM
Ration		(%)		
Corn, rolled	51.88	52.23	47.49	46.18
Alfalfa hay, pelleted	8.00	8.00	8.00	8.00
Cottonseed hulls	20.00	20.00	20.00	20.00
Molasses, cane	3.80	3.80	3.80	3.80
Pelleted supplement	16.32	15.97	20.71	22.02
Supplement				
Soybean meal	88.64	8.78	0.00	0.00
Milo distillers	0.00	0.00	15.37	81.95
Blood meal	0.00	5.07	3.00	10.45
Dicalcium phosphate	1.47	.37	.27	.94
Calcium carbonate	7.11	1.13	.70	3.35
Potassium chloride	.49	.25	.38	1.61
Salt	1.84	.30	.30	1.36
Bovatec 68	.14	.02	.02	.10
Trace mineral	.08	.01	.01	.06
Vitamin A	.13	.02	.02	.10
Vitamin E	.11	.02	.02	.08
Calculated crude protein	5.70	8.36	8.36	8.36
Calculated escape protein	14.50	16.17	16.17	14.50

Nutrients	
NEm,Mcal/cwt	82.83
NEg, Mcal/cwt	49.55
Crude protein, %	15.34
Escape protein	7.70
Crude fiber, %	14.82
K, %	1.00
Ca, %	0.65
P, %	0.33

Results and Discussion

Effects of Rep-Gel on animal health and performance are illustrated in Table 2. Averaged across all four loads of cattle, calves dosed with Rep-Gel at the time of first processing had similar rates of gain, but had 12% ($P<.01$) poorer feed efficiency (8.91 vs. 7.84) than the cattle not receiving Rep-Gel. Poorer feed efficiencies may have resulted from decreased microbial activity in the rumen. Feed efficiency was decreased across all four of the protein treatments, but responses differed with load. For the four loads of cattle, Rep-Gel altered gain by -50%, +7%, -8% and +12%, in the respective loads, and altered feed efficiency by -50%, +7%, -8% and +11%. Whether cattle origin, Rep-Gel dosage or degree of stress is responsible for this variation is not apparent. Applicator guns differed in the amounts of Rep-Gel delivered.

Animal health was not a factor in this study because only 8% of the cattle became sick, 14 head in the Rep-Gel treatment and 14 head in the control treatment.

As shown in Figure 1, in vitro dry matter digestibility of prairie hay was reduced ($P<.01$) at all three concentration levels of Rep-Gel. At .25 times the recommended dosage, at the recommended dosage, and at 4 times recommended dosage digestibility was 19.9%, 19.8%, and 16.5% respectively, versus the control at 46.0%. This may be due to the high levels of selenium and copper in Rep-Gel which can inhibit function of the ruminal microbes.

Based on these findings we do not recommend treating shipping stressed cattle with Rep-Gel as a mineral supplement. Rep-Gel might be useful for treatment of cattle known to be deficient in selenium or copper, but mineral excess may be more deleterious than mineral deficiencies.

Table 2. Effect of Rep-Gel on animal health and performance.[a]

	Treatment		
	Control	Rep-Gel	P<
Animals, Number	166	168	
Pens	14	14	
Arrival wt, lbs.	461	466	NS
Final wt., lbs.	502	503	NS
Daily gain, lbs	1.47	1.32	NS
Feed intake, lbs. DM/day	11.42	11.46	NS
Feed/gain	7.84	8.91	.01

[a] Least square means.

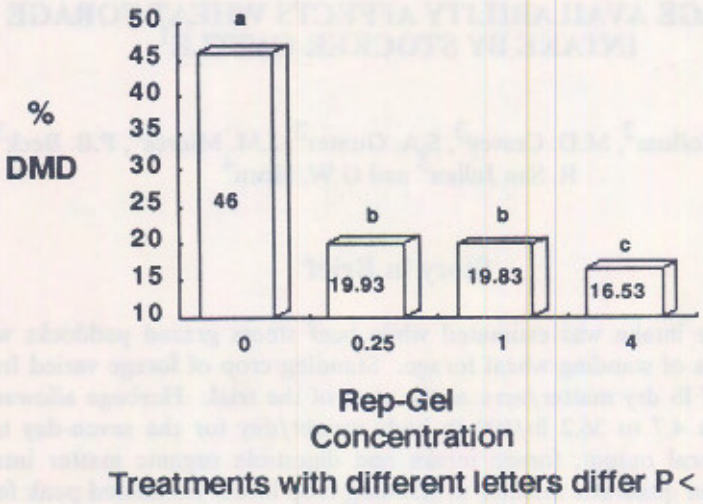

Figure 1. In vitro dry matter digestibilities.

Literature Cited

Tilley, J.M.A. and R.A. Terry. 1963. A two-stage technique for the in vitro digestion of forage crops. J. Brit. Grassland Soc. 18:104.