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An Enzyme-Microbial Feed Product for Finishing Steers

Burt Weichenthal
University of Nebraska-Lincoln, bweich@comcast.net

Ivan G. Rush
University of Nebraska-Lincoln, irush1@unl.edu

Brad Van Pelt
University of Nebraska-Lincoln

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Brad Van Pelt[1]

The MSE feed additive containing multiple enzymes, microbes and yeast appears to be competitive with Rumensin/Tylan for supporting an economical finishing performance in yearling steers.

Summary

Feeding MSE (multiple stabilized enzymes in an enzyme-microbial feed product) at the rate of 2 lb of product per ton of diet dry matter in two trials with finishing yearling steers, increased daily gain by an average of 6.9% over feeding Rumensin-Tylan at 29 g and 10 g per ton, respectively. Feed-to-gain ratio was improved by an average of 5.6% with MSE in the same comparison. Carcass measurements were similar, except for slight increases in hot carcass weight and dressing percent for cattle fed MSE. Percentages of liver abscesses were low and similar for both treatments.

Introduction

The 1996 Nebraska Beef Report (pp. 68-69) included results from a finishing trial using British crossbred yearling steers in which Rumensin-Tylan was compared to MSE, a feed product containing multiple stabilized enzymes plus four strains of bacteria (three Lactobacillus cultures and one of Bacillus subtilis), three strains of yeast (Saccharomyces cerevisiae) and three strains of fungi (two of Aspergillus oryzae and one of Aspergillus niger). Steers fed MSE gained about 10% faster and 7.5% more efficiently than those fed Rumensin-Tylan. Liver abscesses were similar for both treatments. These results suggested Rumensin-Tylan could be replaced by MSE, especially in situations such as organic beef production, without the use of antibiotics. A second trial was initiated to test the same comparison with large-framed yearling steers and a similar diet differing only

in the replacement of 35% of the corn dry matter with ground, ensiled high-moisture corn.

Procedure

Charolais crossbred yearling steers were purchased in the spring for allotment to 12 pens of nine head each for six pens on each of two treatments: (1) Rumensin fed at 29 grams and Tylan at 10 grams per ton of diet dry matter, and (2) the enzyme-microbial feed product MSE fed at 2 lbs per ton of diet dry matter. Three step-up diets were used to reach the final diet, which on a dry matter basis included 53.6% dry rolled corn, 28.9% high-moisture corn, 10.0% corn silage and 7.5% protein-mineral-vitamin supplement including NPN and natural protein to provide 58% crude protein. Calculated nutrient contents of the diet dry matter were 12.5% crude protein, .65 Mcal NEg per lb, .77% calcium and .34% phosphorus.

The MSE was premixed at the rate of 2 lbs of MSE with 8 lbs of finely ground corn so that ten pounds of premix were added to the mixer truck after all other ingredients had been added. During the first 72 hours on feed, MSE was fed at 6 lbs of diet dry matter (three times higher than the long-term feeding rate). Rumensin was fed at 25 grams per ton of diet dry matter during the first three days, at 28 grams during the next step-up and at 29 grams thereafter. A pelleted protein supplement with and without Rumensin-Tylan was used in the study.

The large-framed, yearling Charolais crossbred steers, weighing about 812 pounds when started on trial on February 22, 1996, were purchased from two sources and were not implanted. The steers were fed once a day at levels allowing them to clean up most of the feed before the next feeding. The steers were slaughtered after 139 days on feed and carcasses were evaluated for dressing percentage, fat thickness, marbling, quality grade, rib eye area and yield grade.

One steer died during the test, apparently unrelated to treatment, and one bull was removed. Carcass measurements could not be taken on a few carcasses per treatment at the packing plant, but hot carcass weights were available on 51 carcasses per treatment and measurements for fat thickness and rib eye area were available for 48 carcasses per treatment. Final weights and daily gains were calculated for 51 steers per treatment by dividing hot carcass weights by a common dressing percent (62). Daily gains and carcass measurements for individual steers were analyzed by the general linear model in SAS. Feed intake and feed conversion means were analyzed by SAS with pen as the experimental unit.

Table 1. Rumensin-Tylan vs MSE[a] for large-framed finishing steers, 1996 trial.

	Rumensin-Tylan	MSE
No. of pens	6	6
No. of steers	51	51
Initial weight, lb	810	814
Daily gain, 84d, lb	4.04	4.19
Final weight, lb[b]	1284	1305
Daily gain, 139d, lb[b]	3.41	3.54
Feed DM intake, lb	21.82	21.91
Feed/gain	6.41	6.19
Hot carcass weight, lb	796	809
Dressing percent	63.6	64.0
Fat thickness, in	.31	.29
Rib eye area, sq in	14.3[c]	14.6[d]
Rib eye area, sq in per cwt of carcass	1.8	1.8
Marbling score[e]	5.1	5.0
Quality grade[f]	18.2	18.0
Percent Choice	51.0	45.3
Yield grade	2.1	1.9
Liver abscesses, %	13.2	11.3

[a]MSE = Multiple Stabilized Enzymes, an enzyme-microbial feed product of Natur's Way, Inc., Horton, KS.
[b]Final weight and daily gain were calculated by dividing hot carcass weight by a common dressing % (62).
[cd]Means differ (P < .06).
[e]Marbling scores: Small begins at 5.0, Modest at 6.0.
[f]Quality grade scores: Choice- begins at 18.0.

Results

Average daily gains for Rumensin-Tylan and MSE treatments were 4.04 and 4.19 lb at 84 days, and 3.41 and 3.54 lb (P = .42) at 139 days on feed, respectively (Table 1). Means for dry matter intake were similar for both treatments. At 84 days, a power outage during hot weather caused the cattle to be without water, which reduced feed intake. However, both treatment groups came back on full feed in a few days. Final feed to gain ratios were 6.41 and 6.19 for Rumensin-Tylan and MSE, respectively, a difference not statistically significant (P = .24).

Means for carcass measurements were similar between treatments. Numerical differences in hot carcass weight, dressing percent, marbling score and yield grade, were not statistically significant. Rib eye area was larger (P < .06) with MSE, but rib eye area per cwt of carcass was the same. Percentages of liver abscesses were 13.2 and 11.3% for Rumensin-Tylan and MSE, respectively, which were neither excessive nor unusual for a high-grain diet in which the only roughage component was in the corn silage fed at 10% of diet dry matter.

Since the 1995 and 1996 trials were similar in design, and there were no interactions between years, results were pooled (Table 2) for statistical analysis. Pooled means for 12 pens on each treatment resulted in improvements for MSE (P ≤ .1) in final weight (adjusted to a common 62% carcass dress), hot carcass weight, daily gain and feed conversion. Dressing percent was higher for MSE (P < .05). Feeding MSE at the rate of 2 lb of product per ton of diet dry matter increased daily gain by an average of 6.9% over the feeding of Rumensin-Tylan at 29 g and 10 g per ton, respectively. Feed-to-gain ratio was

(Continued on next page)

Table 2. Rumensin-Tylan vs MSE[a] for finishing yearling steers, 1995 and 1996 trials pooled.

	Rumensin-Tylan	MSE
No. of pens	12	12
No. of steers	96	94
Initial weight, lb	835	838
Final weight, lb[b]	1267	1298
Daily gain, 130 d, lb[b]	3.32[c]	3.55[d]
Feed DM intake, lb	22.36	22.62
Feed/gain ratio	6.77[c]	6.39[d]
Hot carcass weight, lb	785[c]	805[d]
Dressing percent	63.1[e]	63.7[f]
Fat thickness, in	.42	.41
Rib eye area, sq in	13.6[e]	13.9[f]
Rib eye area, sq in per cwt of carcass	1.7	1.7
Marbling score[g]	5.3	5.2
Quality grade[h]	18.5	18.3
Percent Choice	63.6	58.3
Yield grade	2.5	2.4

[a]MSE = Multiple Stabilized Enzymes, an enzyme-microbial feed product of Natur's Way, Inc., Horton, KS.
[b]Final weight and daily gain were calculated by dividing hot carcass weight by a common dressing % (62).
[cd]Means differ ($P \leq .1$).
[ef]Means differ ($P < .05$).
[g]Marbling scores: Small begins at 5.0, Modest at 6.0.
[h]Quality grade scores: Choice- begins at 18.0.

improved by an average of 5.6% when MSE was fed. Carcass measurements were similar except for increases in hot carcass weight ($P < .1$) and dressing percent ($P < .05$) with MSE. Although the mechanism for any response to MSE remains to be defined, improved feed utilization is suggested during ruminal digestion. The costs of the two feed additive treatments were similar, so the feeding of MSE appears to be competitive with the feeding of Rumensin-Tylan to finishing yearling steers. These results may also be useful for producers of organic beef where the routine feeding of antibiotics is avoided.

[1]Burt Weichenthal and Ivan Rush, Professors, Animal Science; Brad Van Pelt, research technician, Panhandle Research and Extension Center, Scottsbluff.