INFLUENCE OF SUPPLEMENTAL FAT AND MONENSIN PLUS TYLOSIN ON PERFORMANCE AND CARCASS TRAITS OF FINISHING STEERS

R.T. Brandt, Jr., T.G. Nagaraja, and J.K. Elliott[1]

Summary

Interactions between supplemental fat (3.5%) and monensin plus tylosin (25 plus 10 g/ton, respectively) on animal performance and carcass traits were evaluated in a 125-d finishing trial. Interactions on feed consumption (P = .07) and feed efficiency (P = .11) suggested that the ionophore response was diminished in the presence of supplemental fat. Steers fed monensin plus tylosin had a lower (P = .005) incidence of liver abscesses whether fat was fed or not, indicating that supplemental fat had no effect on tylosin activity.

(Key Words: Monensin, Tylosin, Fat, Liver abscess, Cattle Performance.)

Introduction

Supplemental fat additions to feedlot finishing diets can improve animal performance and reduce cost of production in some situations. However, how fat interacts with other dietary ingredients and(or) nutrients has not been thoroughly evaluated. One such case is the animal response to ionophores in high (4-6%) fat-containing rations. It is possible that response to the ionophore may be altered, because ionophore antibiotics are fat-soluble compounds, and(or) some fats have antimicrobial activity of their own in the rumen. Previous research at Kansas State has shown a diminished response to ionophores with finishing diets containing 3.5-4% fat. The present study was conducted to further evaluate potential interactions between supplemental fat and ionophores in finishing diets.

Experimental Procedures

One hundred twenty-eight, mixed British, crossbred, feeder steers (692 lb) were utilized in a 2 × 2 factorially arranged, randomized, complete block experiment. Main effects evaluated were monensin/tylosin supplementation (0/0 or 25/10 g/ton, respectively, air dry basis) and supplemental fat (0 or 3.5% yellow grease). Steers were implanted; treated for internal and external parasites; and vaccinated against IBR, BVD, PI_3 and seven clostridial species. Steers were weighed full on 2 consecutive days, allotted to pens (2 pens of 11 head and one pen of 10 head per treatment combination), and stepped up in 9 d to the treatment diets (Table 1). Steers receiving monensin and tylosin were fed 12.5 and 10 g/ton, respectively, for 7 d before being placed on the final level of 25 and 10 g/ton. The trial was conducted for 125 d at the Southwest Kansas Research-Extension Center, Garden City. Final weights were the average of weights on 2 consecutive days. The steers were slaughtered at IBP, Inc., Holcomb, and carcass data were collected following a 24 h chill.

Results and Discussion

During the initial 39 d of the study, fat and monensin/tylosin (MT) interacted (P = .06) on feed efficiency (feed/gain, Table 2). Compared to steers fed no fat or MT, steers fed MT (with no fat) gained 6.4% more efficiently. Addition of fat to the MT-containing diet increased feed requirements, suggesting that a period of time may be required for adaptation to this treatment.

[1]Southwest Kansas Research-Extension Center, Garden City.

Over the entire trial (0-125 d), supplemental fat and MT interacted on DM intake (P = .07). For steers fed no fat, MT reduced intake 4.8%. However, addition of fat to the MT-containing diet did not suppress intake. The same trend was observed during the initial 39 d period. The intake response noted here is consistent with previous research we have conducted and seems to suggest that fat supplementation may interact with monensin to alleviate its effect on intake suppression.

A fat by MT interaction was also observed (P = .11) for feed efficiency. Addition of fat or MT to the basal diet improved feed efficiency by 7.4 or 7.2%, respectively. However, the combination of fat and MT resulted in no improvement in efficiency compared to fat or MT independently. These data suggest that the ionophore response by feedlot cattle is not additive to fat in diets at a 3.5% level.

Fat supplementation increased (P < .05) hot carcass weights and dressing percent and tended (P = .15) to increase backfat thickness. These results are consistent with previous research with finishing yearling steers fed supplemental fat in excess of 120 d.

Steers fed MT had a lower (P = .005) incidence of liver abscesses, irrespective of whether MT was added to the diet, indicating that supplemental fat did not negatively effect the activity of tylosin.

Table 1. Composition of Diets[a]

Ingredient	0% Fat	3.5% Fat
Steam-rolled wheat	41.7	41.5
Cracked corn	41.7	41.5
Alfalfa hay	4.0	4.0
Corn silage	4.0	4.0
Pelleted supplement	5.1	5.5
Molasses	3.5	-
Yellow grease	-	3.5

Dry basis. Diets contained 12.6% CP,

Table 2. Fat and Monensin/Tylosin Effects on Steer Performance and Carcass Traits

	– Monensin/tylosin		+ Monensin/tylosin		
Item	0% Fat	4% Fat	0% Fat	4% Fat	SE
No. pens	3	3	3	3	
No. steers	32	32	32	32	
Initial wt, lb	692	690	695	691	2.0
Final wt, lb[a]	1077	1096	1088	1097	11.4
0-39 d					
Daily gain, lb	3.82	3.83	3.98	3.55	.14
Daily feed, lb DM	17.33	17.11	16.73	17.30	.33
Feed/gain[b]	4.54	4.46	4.25	4.87	.15
0-125 d					
Daily gain, lb[a]	3.08	3.24	3.15	3.25	.09
Daily feed, lb DM[b]	18.60	18.26	17.70	18.38	.24
Feed/gain[c]	6.08	5.63	5.64	5.67	.13
Carcass data					
Hot wt, lb[d]	683	705	687	702	8.6
Dressing percent[d]	65.5	66.1	65.1	65.9	.28
Backfat, in	.38	.40	.36	.41	.03
Marbling	Sl^{74}	Sl^{59}	Sl^{70}	Sl^{75}	.11
Liver abscesses,%[e]	28	42	6	3	7.2

[a]Final weights were pencil shrunk 4%.
[b]Fat × ionophore interaction (P < .08).
[c]Fat × ionophore interaction (P = .11).
[d]Fat effect (P < .05).
[e]Monensin/tylosin effect (P = .005).