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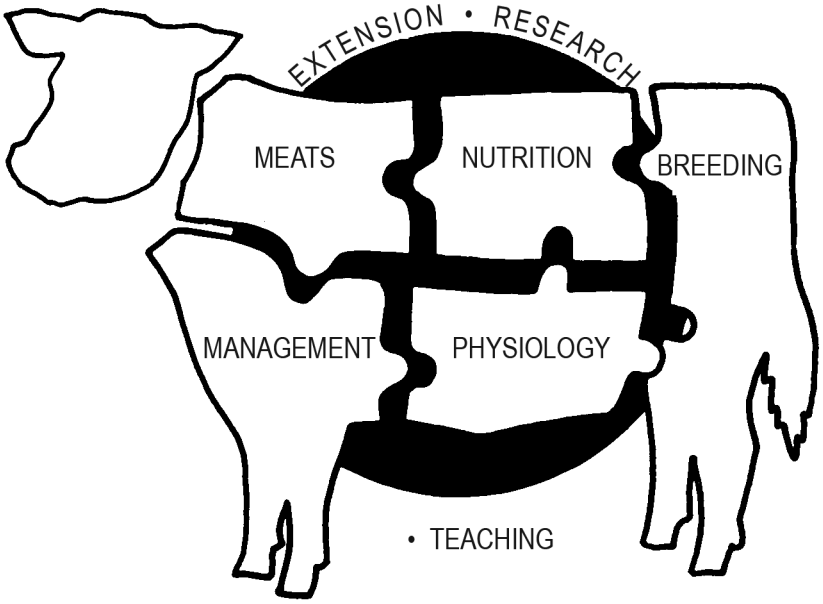

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IANR

Evaluating Two Rates of Monensin Fed During the Grain Adaptation Period on Cattle Performance and Carcass Characteristics

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Summary

Performance and carcass characteristics were evaluated when feeding two rates of monensin in feedlot adaptation diets. Monensin was supplemented at either 360 or 480 mg/head/day during the adaptation period. During the adaptation period, interim body weight was greater and dry matter intake was less for steers fed the 360 mg/head/day treatment of monensin. Subsequently, an improvement in average daily gain and feed efficiency was observed with the 360 mg/head/day treatment. However, there were no statistical differences in final performance and carcass characteristics. These results suggest it is not beneficial to feed the 480 mg/head/day rate of monensin in the adaptation period.

Introduction

Monensin is an ionophore commonly fed to improve F:G and prevent/control coccidiosis in feedlot cattle. Additionally, feeding monensin decreases acidosis by limiting the amount of time ruminal pH is below 5.6 (*1997 Nebraska Beef Cattle Report,* pp. 49-52). With less incidence of acidosis, it has also been observed that intake variation decreases when cattle are fed monensin (*Journal of Animal Science*, 2003, 81:2869-2879). Another study reported that higher concentrations of monensin were more beneficial during the step-up phase versus the entire feeding period (*Plains Nutrition Council Proceedings,* 2010, pp. 112-113). The approved monensin concentration was increased from 33 g/ton (DM) and 360 mg/steer to 44 g/ton and 480 mg/steer by the FDA in 2006. Feeding 480 mg/head/day monensin during the adaptation period did not improve feedlot performance or carcass characteristics when compared to 360 mg/head/day (2013 Nebraska Beef Cattle Report, pp. 60-61). The objective of the current experiment was to replicate the 2013 trial and determine if a difference exists between monensin rates of 360 or 480 mg/head/day during adaptation on cattle performance and carcass characteristics.

Materials and Methods

One hundred ninety-eight crossbred steers (initial BW = 912 ± 37 lb) were utilized in a feedlot finishing trial at the UNL Panhandle Research Feedlot near Scottsbluff, Neb. Cattle were limit-fed a diet at 2% BW consisting of 30% wheat straw, 20% corn silage, 20% dry-rolled corn (DRC), 15% wet distillers grains with solubles (WDGS), 10% corn condensed distillers solubles (CCDS), and 5% supplement (DM basis) for five days before the start of the experiment. Two-day initial weights were recorded on day 0 and 1 which were averaged and used as the initial BW. The steers were blocked by BW into light and heavy BW blocks, stratified by BW and assigned randomly to one of 18 pens with pen assigned randomly to one of two dietary treatments. There were 11 head per pen and nine replications per treatment. Dietary treatments included 360 or 480 mg/head/day monensin during the adaptation period. Treatments were fed a common diet and 360 mg/head/day monensin after adaption through finish. Monensin was added via micro machine to ensure the proper rate was administered.

The adaptation program consisted of five diets where DRC was increased as straw and silage were decreased (Table 1). Besides monensin rate, the diets were the same for all treatments. On day 24 and 25, upon completion of the adaptation period and after

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Table 1. Dietary treatments for steers fed two rates of monensin during grain adaptation (DM basis).

Days fed:	1 - 4 Step 1	5 - 8 Step 2	9 - 13 Step 3	14 - 18 Step 4	Finisher
Ingredient, %[1]					
Dry-rolled corn	34.3	44.3	54.3	64.3	69.3
WDGS[2]	10	10	10	10	10
CCDS[3]	10	10	10	10	10
Wheat straw	25	20	15	10	5
Corn silage	15	10	5	—	—
Supplement[4]	5	5	5	5	5
Urea	0.7	0.7	0.7	0.7	0.7
Limestone	1.6	1.6	1.6	1.6	1.6
Salt	0.3	0.3	0.3	0.3	0.3
Vitamin A, IU	1000	1000	1000	1000	1000
Vitamin D, IU	125	125	125	125	125
Vitamin E, IU	1.5	1.5	1.5	1.5	1.5

[1]Diets contained 360 or 480 mg/steer daily monensin and 90 mg/steer daily tylosin (DM) added via micro machine (Model 271 Weigh and Gain Generation 7; Animal Health International).
[2]Wet distillers grains with solubles.
[3]Corn condensed distillers solubles.
[4]The same liquid supplement was used for all diets and contained: 30 ppm Zn, 50 ppm Fe, 10 ppm Cu, 20 ppm Mn, 0.1 ppm Co, 0.5 ppm I, and 0.1 ppm Se.

being on a common diet for seven days, two-day weights were recorded, averaged, and used as the interim BW. Cattle were shrunk 4% for the performance analysis of the adaptation period.

All diets contained 10% WDGS, 10% CCDS, and 5% liquid supplement (DM basis). Urea was added at 0.7% of the diet DM to meet or exceed MP requirements of the animal. Steers were implanted with Revalor® XS (Merck Animal Heath, Summit, N.J.) on day 1. Animals in the heavy BW block were harvested on day 86 and the light BW block was harvested on day 114 (Cargill Meat Solutions, Fort Morgan, Colo.). Hot carcass weight and liver scores were recorded on the harvest date. Fat thickness, LM area, and marbling score were recorded after a 48-hour chill. Final BW, ADG, and F:G were calculated using HCW adjusted to a common 63% dressing percentage.

Data were analyzed using the MIXED procedure of SAS (SAS Institute, Inc., Cary, N.C.) as a randomized block design. Pen was the experimental unit and block was treated as a random effect. Intake variance and percentage of liver abscesses were both analyzed using the GLIMMIX procedure of SAS.

Table 2. Effect of two rates of monensin during grain adaptation on performance and carcass characteristics.

	Treatment			
Item	360[1]	480[2]	SEM[3]	F-Test
Interim Performance[4]				
Initial BW, lb	901	899	30	0.66
Interim BW, lb[5]	1000	989	26	<0.01
DMI, lb/day	22.65	22.77	0.14	<0.01
ADG, lb[6]	3.96	3.60	0.16	0.01
F:G[6,7]	6.13	6.76	0.01	<0.01
Overall Performance				
Final BW, lb[8]	1355	1355	44	0.98
DMI, lb/day	29.28	29.64	0.18	0.17
ADG, lb[8]	4.54	4.54	0.11	0.98
F:G[9]	6.59	6.63	0.003	0.45
Carcass Characteristics				
HCW, lb	854	854	28	0.98
Marbling Score[9]	533	527	27	0.61
12th rib fat, in	0.52	0.52	0.05	0.95
LM area, in. sq.	12.62	12.51	0.08	0.35
Calculated YG[10]	3.40	3.44	0.23	0.67
Dressing Percent	61.30	61.44	0.54	0.50
Liver Abscess, %[11]	19.19	12.12	—	0.18
A, %	16.16	8.08	—	0.09
A+, %	3.03	4.04	—	0.70

[1]360 mg/head/day monensin.
[2]480 mg/head/day monensin.
[3]SEM = Standard error of the mean for the interaction.
[4]Interim Performance = calculated after 18 day adaptation period and after being on a common finishing diet for seven days.
[5]Weight taken seven days after adaptation period and pencil shrunk 4%.
[6]Calculated from interim BW.
[7]Analyzed as G:F, reciprocal of F:G.
[8]Final BW calculated from hot carcass weight adjusted to a common dressing percentage of 63%.
[9]Marbling score: 400 = Slight 0, 500 = Small 0.
[10]Calculated YG = 2.5 + 2.5 (fat thickness, in) – 0.32 (LM area in. sq.) + 0.2 (2.5 KPH fat, %) + 0.0038 (hot carcass weight, lb).
[11]Liver score: A = 3 or 4 abscesses; A+ = 4 or more abscesses.

Results

Performance measured after the adaptation period (day 25) showed lower ($P < 0.01$) interim BW when 480 mg/head/day of monensin was fed (Table 2). Dry matter intake was greater ($P < 0.01$) for steers fed the 480 mg/head/day rate. There were no differences ($P \geq 0.39$) in the DMI variance between treatments during the adaptation period or the first seven days on the finishing diet (data not presented). There was less variation when cattle started consuming the finishing feed when compared to the variation in intake during the adaptation period. Additionally, an improvement ($P \leq 0.01$) was observed for ADG and F:G with 360 mg/head/day monensin.

The steers on the 360 mg/head/day rate consumed less feed and gained more weight than the steers on the 480 mg/head/day rate making them more efficient during the adaptation period. This could decrease acidosis incidences.

No significant differences ($P \geq 0.17$) were observed for total performance over the feeding period. Additionally, HCW, marbling, 12th rib fat, LM area, calculated YG, dressing percent, or overall liver scores were not affected ($P \geq 0.18$) by monensin rate. Cattle fed 480 mg/head/day monensin tended to have ($P = 0.09$) lower percentage of "A" liver scores which may suggest less acidosis for steers on this treatment.

Feeding 360 versus 480 mg/steer daily of monensin during the adaption period had no impact on overall performance of the cattle.

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