EXTENSION
BEEF CATTLE RESEARCH UPDATE
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Effects of Monensin Dose on Performance of Grazing Beef Steers

The supplementation with ionophores, such as monensin, is a cost-effective and efficient way to increase the body weight and average daily gain of forage-fed calves. Knowing the most effective dosage of monensin provides an economic advantage to beef producers. Monensin is labeled by FDA to increase weight gain in pasture cattle when fed at a level of 50 to 200 mg per head per day. Traditionally, a daily dose of 200 mg of monensin per calf appears to be the level of monensin most widely used in supplementation research, as it has consistently been shown to improve gain of forage-fed cattle. Free-choice mineral consumption may be reduced in mineral containing monensin.[1, 2, 3] University of Arkansas research determined the effects of monensin supplementation in a free-choice loose mineral on performance and mineral intake of grazing beef steers.[4]

In this study, treatments consisted of offering growing calves free-choice access to nonmedicated mineral (0M) or supplementing with monensin via mineral containing either 800 g/ton (800M) or 1600 g/ton (1600M) of monensin. Target daily mineral intake was 0.25 lb (4 oz) per steer to provide monensin intakes of 0, 100, and 200 mg of monensin per steer per day. Mineral supplements were offered free choice in covered feeders designed for mineral supplementation. This research was replicated over a 14-month period using six blocks of cattle (605 steer calves, 613 lb average initial weight). The calves were fed hay with a hand-fed supplement (block 1); grazed wheat pasture (blocks 2, 3, and 6); or bermudagrass pasture (blocks 4 and 5). There were no treatment × diet interactions ($P \geq 0.97$); therefore, data were pooled across blocks for statistical analysis.

These researchers reported that across all blocks, including monensin in the mineral decreased ($P < 0.01$) overall mineral consumption compared with the unmedicated mineral and increasing monensin concentration led to reduced mineral intake ($P < 0.01$). Monensin intakes based on mineral consumption were calculated to be 0, 109, and 170 mg per steer for the 0M, 800M, and 1600M treatments, respectively, as daily mineral consumption for the steers were 0.31, 0.27, and 0.21 lb per steer, respectively.

The effect of monensin supplementation on performance of the steers is shown in Table.1. These researchers reported that feeding monensin to growing steers on forage-based diets increased ($P \leq 0.02$) total gain per steer by 10.2% (16.5 lb) and steer average daily gain (ADG) by 8.7% (0.19 lb) compared with 0M steers. Increasing monensin dose did not result in differences in ADG ($P = 0.95$) or total gain ($P = 0.90$) between the 800M and 1600M treatments (targeted daily monensin intakes of 100 and 200 mg).

Table 1. Effect of monensin supplementation on performance of growing steers across blocks.

	Treatment[1]			Contrast P-value[2]	
Item	0M	800M	1600M	1	2
Initial Weight, lb	613	615	611	0.89	0.63
Final Weight, lb[1]	774	794	787	0.02	0.55
ADG, lb	2.12	2.32	2.29	0.02	0.95
Total Gain, lb	161	179	176	0.01	0.90

[1]Steers were given free-choice access to nonmedicated mineral (0M) or supplemented with monensin via mineral containing 800 g/ton monensin (800M) or 1,600 g/ton monensin (1600M).
[2]Contrasts: 1 = 0M versus 800M and 1600M and 2 = 800M versus 1600M.
Adapted from Weiss et al., 2020

In conclusion, these results indicate that monensin supplementation provided in a mineral can improve final BW and gain of steer calves in a variety of forage systems. In addition, the data suggest that although monensin limits intake of free-choice mineral, this is not detrimental to performance response to monensin. It also suggests that providing a greater dose of monensin through increased mineral consumption would not have any additional benefits on animal performance compared with a reduced dose from lower mineral intake. This has the potential to be an economic advantage to producers, given similar gain responses with lower mineral intakes.

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[2] Fieser, B. G., G. W. Horn, and J. T. Edwards. 2007. Effects of energy, mineral supplementation, or both, in combination with monensin on performance of steers grazing winter wheat pasture. J. Anim. Sci. 85:3470-3480.

[3] Beck, P., T. Hess, D. Hubbell, G. D. Hufstedler, B. Fieser, and J. Caldwell. 2014. Additive effects of growth promoting technologies on performance of grazing steers and economics of the wheat pasture enterprise. J. Anim. Sci. 92:1219-1227.

[4] Weiss, C. P., P. A. Beck, M. S. Gadberry, T. Hess, and D. Hubbell, III. 2020. Effects of monensin dose from a self-fed mineral supplement on performance of growing beef steers on forage-based diets. Appl. Anim. Sci. 36:515-523.