EFFECT OF ALTERNATE-DAY FEEDING OF A MONENSIN-CONTAINING ENERGY SUPPLEMENT ON WEIGHT GAINS AND VARIATION IN SUPPLEMENT INTAKE BY WHEAT PASTURE STOCKER CATTLE[1]

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Story in Brief

An 83-day trial was conducted to test effects of a 4-pound monensin-containing energy supplement on stocker cattle grazing wheat pasture. Forty-two fall-weaned Hereford x Angus steers with an average initial weight of 543 pounds were used to measure supplement intake variation and daily gain. One group of steers was individually hand fed the supplement every two days with the unconsumed supplement reweighed to determine intake. The other group of steers received no supplement. Steers receiving the monensin supplement gained .56 lb/day more than the unsupplemented steers. Mean intake variations were used to separate the cattle into low, moderate, and high variations in supplement consumption. Cattle with a low variation in supplement intake had a higher daily gain than did those with high supplement intake variation. Supplemented steers were also divided into monensin consumption groups consisting of 1) steers consuming less than 150 mg monensin/day, and 2) steers consuming greater than 150 mg monensin/day. Steers with high monensin intakes tended to have higher rates of gain than did steers with low monensin intakes. These data accentuate the importance of not only formulating supplements and managing supplementation programs in order to achieve desired mean intakes by the herd, but to also minimize variability of supplement intake.

(Key Words: Monensin, Wheat Pasture, Growing Cattle, Intake.)

Introduction

We have previously reported (Beck et al. 1993; Horn et al. 1990, 1992) on studies aimed at developing a self-limiting, monensin-containing energy supplement for growing cattle on wheat pasture. Over a 4-year period, the

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[1]This material is based upon work supported by the Cooperative State Research Service, U.S. Department of Agriculture, under Agreement No. 89-34198-4288. Any opinions are those of the author(s) and do not necessarily reflect the view of the U.S. Department of Agriculture.

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supplementation program has consistently increased daily weight gains of cattle by about .50 lb and has increased profits by $15 to $31 per head, depending on feed cost and profit potential of the cattle. While some producers prefer to self-feed supplements, others prefer hand feeding. The objective of this study was to determine the effects on weight gain of hand-feeding a similar supplement on an every other day basis. In addition, effects of variation in supplement and monensin intake were assessed.

Materials and Methods

Forty-two fall-weaned Hereford x Angus steer calves with a mean initial weight of 543 ± 53 lb were randomly allotted to two treatments. The unsupplemented group was a negative control and received no supplement of any kind, while the supplemented group received a monensin- containing energy supplement. Both groups were allowed to graze the same wheat pasture in the 83-day trial beginning December 31, 1992 and ending March 23, 1993 with cattle weights taken at these dates after 14 to 16 hour shrinks without feed and water. To avoid potential fill differences between supplemented and unsupplemented animals, ending weights were taken three days after final feeding of the supplement.

All animals were gathered from the pasture every two days. Steers in the supplemented group were hand-fed 4 lb of the supplement in individual feeding stalls in a barn adjacent to the wheat pasture, and were allowed two hours to consume the supplement. Actual supplement intake was measured by reweighing the unconsumed feed and subtracting from the total offered to the animal. The supplement was fed as a 3/16 inch pellet and contained 90 mg/lb of monensin. The supplement consisted primarily of ground milo and wheat middlings and other ingredients as shown in Table 1.

Table 1. Feedstuff composition of monensin-containing energy supplement.

Ingredient	% As-fed basis
Ground milo	66.65
Wheat middlings	21.00
Sugarcane molasses	4.80
Limestone	4.00
Dicalcium phosphate	2.55
Salt[a]	.50
Magnesium oxide	.35
Rumensin 60 Premix	.15
Monensin content, mg/lb supplement	90

[a] Fine mixing salt (99.5% NaCl).

Effect of the supplement on live weight gains of the steers was analyzed using a t-test in SAS. To determine effects of intake variation, the supplemented group was divided into three subgroups as follows: 1) lowly variable (supplement intake standard deviation < .9 lb/feeding); 2) moderately variable (supplement intake standard deviation .9 to 1.25 lb/feeding); and, 3) highly variable (supplement intake standard deviation >1.25 lb/feeding). These subgroups were compared using Least Significant Difference procedure in SAS.

In order to determine if average monensin intake levels during the trial affected performance, the supplemented group was also divided into groups with mean daily monensin consumption of 1) greater than 150 mg/steer and 2) less than 150 mg/steer. Daily gains of both groups were regressed on monensin intake, and the slopes were compared using dummy variables and the GLM procedures of SAS.

Results and Discussion

Mean daily gain of steers fed the monensin-containing energy supplement was .56 lb greater (P<.0001) than unsupplemented steers (Table 2). Calculated daily supplement intake was 1.55 lb/steer. Average supplement conversion expressed as lb supplement/lb of increased gain and calculated on an individual animal basis was 4.16 ± 2.92. This weight gain response to hand-feeding the supplement every other day is very similar to that reported by Beck et al. (1993) and Horn et al. (1990, 1992) in which a monensin supplement of similar feedstuff composition was self-fed in meal form to stocker cattle on wheat pasture.

Variation of supplement intakes decreased as mean supplement intakes increased (i.e., the two were inversely related) as shown in Table 3, and mean supplement intakes were significantly different among all three levels of variation. This suggests that cattle with the least variable intakes tended to consume the entire amount of supplement that was offered more often than

Table 2. Mean supplement intake, conversion and weight gains of steers.

	Unsupplemented	sd	Supplemented	sd
Number of steers	17		25	
Initial weight, lb	531	59	552	48
Final weight, lb	730[a]	54	796[b]	54
Supplement intake, lb/day	----	--	1.55	.27
Daily gain, lb	2.31[a]	.23	2.87[b]	.32
lb supplement/lb increased gain	----	--	4.16	2.92

[a,b] Means in the same row with uncommon superscripts differ (P<.001).

Table 3. Effects of variation in supplement intake on performance.

	Low[a] variation	Moderate[b] variation	High[c] variation
Number of steers	8	11	6
Supplement intake, lb/day	1.82[d]	1.57[e]	1.16[f]
Daily gain, lb	3.06[d]	2.83[de]	2.56[e]

[a] Supplement intake standard deviation <.9 lb/feeding.
[b] Supplement intake standard deviation .9 to 1.25 lb/feeding.
[c] Supplement intake standard deviation >1.25 lb/feeding.
[d,e,f] Rows with uncommon superscripts differ (P<.05).

Table 4. Effects of monensin intake levels on performance.

	Low[a] monensin intake	High[b] monensin intake
Number of steers	14	11
Monensin intake, mg/d	123[c]	161[d]
Daily gain, lb	2.75[c]	2.95[d]

[a] Monensin intake <150 mg/hd/day.
[b] Monensin intake >150 mg/hd/day.
[c,d] Rows with uncommon superscripts differ (P<.07).

those in higher variable groups. Daily gains also increased as variation in supplement intake decreased.

Supplemented steers with monensin intakes greater than 150 mg/day tended to have greater weight gains than those with monensin intakes less than 150 mg/day (Table 4). These data accentuate the importance of not only formulating supplements and managing supplementation programs in order to achieve desired mean intakes by the herd, but to also minimize variability of supplement intake.

Literature Cited

Beck, P.A. et al. 1993. Okla. Agr. Exp. Sta. Res. Rep. P-933:256.
Horn, G.W. et al. 1990. Okla. Agr. Exp. Sta. Res. Rep. MP-129:209.
Horn, G.W. et al. 1992. Okla. Agr. Exp. Sta. Res. Rep. MP-136:301.