

EFFECT OF RONNEL ON WEIGHT GAIN OF YEARLING HEIFERS ON RANGE¹

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Summary

Forty-eight Hereford X Angus and Hereford yearling heifers were stratified by weight and breed and randomly assigned to four treatments with two replications. Treatments consisted of a control group receiving no ronnel and three groups receiving 480, 640 or 800 mg per head per day. Ronnel is an organophosphate insecticide approved and used for systemic control of heel fly larvae and lice and as an oral larvacide for horn fly control. Forced use of insecticidal dust bags was employed to assure that effects of ronnel as an insecticide would be negated. Heifers were grazed on crested wheatgrass pastures, fed a barley and biuret supplement to provide for a daily gain of .7 kg or better, and gathered daily and sorted into pens to receive their supplements. A diluted liquid formulation containing 20% ronnel was premixed into ground barley and mixed with the remaining portion of the supplement. Daily gains over the 92-day trial period were not significantly different ($P>.05$) with the 0, 480, 640 and 800 mg treatment groups gaining .75, .75, .73 and .78 kg, respectively.

Introduction

Ronnel, an organophosphorus insecticide, is a systemic for control of heel fly larvae, lice and horn flies in cattle. In recent years, ronnel has shown promise as a feed additive. In feedlot cattle, positive but nonsignificant ($P>.05$) results have been reported for daily gains and feed efficiency with ronnel fed at various levels (Rumsey *et al.*, 1975; Riley and Ware, 1977; Wooden and Algeo, 1977; Thomas and Ware, 1978; Rumsey 1979).

The improvement in feed conversion and additional average daily gain (ADG) in feedlot cattle stimulated interest in ronnel for cattle on growing rations and on pasture. Wooden and Algeo (1977) reported a nonsignificant ($P>.05$) increase in ADG and feed efficiency with ronnel fed to steers on a growing ration in dry lot and Cross *et al.* (1979) found that ronnel was not an efficacious growth stimulant for steers on pasture.

This trial was conducted to test the effect of ronnel on yearling heifer gains on range and the effect of various levels of ronnel.

Materials and Methods

Forty-eight Hereford X Angus and Hereford yearling heifers, averaging 293 kg, were stratified by weight and breed and randomly assigned to four treatments with two replications. Treatments consisted of a control group receiving a supplement without

ronnel and three groups receiving the control supplement with 480, 640 or 800 mg ronnel per head per day. The barley and biuret supplement was calculated to provide for daily gains of .7 kg or better. The trial was initiated on July 10 and terminated on September 10. Originally the trial was to start on May 2, but due to difficulties in getting animals to eat their supplement the start was delayed until all animals were consuming their supplement. Intake difficulties were not treatment related.

Heifers were grazed on crested wheatgrass pastures and gathered daily and sorted into pens by treatment groups to receive their supplements. Color coded ear tags were used for easy identification. At the start of the trial, .05 kg of biuret and .59 kg of barley was fed and these levels were increased as forage quality declined to .14 kg of biuret and 1.36 kg of barley by August 9 and continued at this level to the end of the trial. An emulsifiable liquid formulation containing 20% ronnel was diluted with water and premixed into ground barley and then mixed with the remaining portion of the supplement. Samples were taken of each mix and analyzed by AOAC (1975), 42.141 method for ronnel concentration throughout the trial.

Heifers were treated with injectable Tramisol[®] prior to going onto range for internal parasite control. Forced use of commercial insecticidal dust bags was employed to assure that effects of ronnel as an insecticide would be negated.

A portion of these heifers were replacements and a bull was run with them for 63 days prior to the initiation of the trial. Stage of pregnancy was determined by rectal palpation after termination of the trial.

Water was hauled and available at all times. Salt and a salt-bonemeal mix was also available at all times. Forage was sampled periodically for chemical analysis to determine supplement levels required. Each animal was individually identified by numbered ear tags and individually weighed initially and every 28 days during the trial, after an overnight shrink off of feed and water.

Analyses of variance and least significant differences were applied to the data to test for differences between treatments (Steel and Torrie, 1960).

Results and Discussion

Results of sample analyses show the ronnel concentrations in the supplement fed throughout the trial averaged 99, 106 and 103% for the 480, 640 and 800 mg treatments, respectively. Variation between batches was small indicating that heifers received close to the desired level of ronnel at all times.

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Average daily gains of heifers are shown in table 1. Daily gains over the 92-day trial period were not significantly different ($P>.05$) with the 0, 480, 640 and 800 mg treatment groups gaining .75, .75, .73 and .78 kg, respectively. Overall gains of those receiving ronnel were identical to the controls (.75 kg).

TABLE 1. AVERAGE DAILY GAIN (kg) OF HEIFERS RECEIVING VARIOUS LEVELS OF RONNEL

Replicate	Ronnel/hd/day, mg			
	0	480	640	800
1	.75	.73	.80	.81
2	.75	.79	.67	.73
Mean \pm SEM	.75 \pm .04	.75 \pm .04	.73 \pm .04	.78 \pm .04

Possible effects of stage of gestation were investigated using rectal palpation results for determining pregnancy and estimating age of fetus. Salisbury and Van Demark (1961) was used to estimate weight gain due to conceptus, including weight of fetus, amniotic fluid, fetal membranes and empty uterus. Out of 12 heifers, 10, 9, 9 and 9 were pregnant for the control, 480, 640 and 800 mg treatments, respectively. Estimated fetus ages ranged from 85 to 150 days. Fetal ages between treatments were almost identical with control, 480, 640 and 800 mg being 126, 130, 127 and 127 days, respectively.

Average daily gains \pm the standard error of the mean after removing the weight gain due to pregnancy were .67 \pm .03, .69 \pm .03, .66 \pm .03 and .70 \pm .03 kg for the control, 480, 640 and 800 mg treatment groups, respectively. Overall gains of those receiving ronnel were .68 kg as opposed to .67 kg for the controls. Taking into account weight gain due to conception did not change the rank of treatments or the magnitude of the differences.

In conclusion, feeding ronnel at various levels did not improve weight gain of supplemented yearling heifers grazing on range.

Literature Cited

- AOAC. 1975. Official Methods of Analysis (12th Ed.). Association of Official Analytical Chemists, Washington, D.C.
- Cross, D. L., W. J. Caldwell, S. L. Moore and R. F. Wheeler. 1979. Efficacy of ronnel for increasing weight gain of steers on pasture. South Carolina Agr. Exp. Sta. Circ. 181.
- Riley, J. G. and D. R. Ware. 1977. Effect of ronnel on performance of feedlot steers. J. Anim. Sci. 45 (Suppl.1):253(Abstr.).
- Rumsey, T.S. 1979. Performance, ruminal measurements and blood plasma amino acids of steers fed ronnel. J. Anim. Sci. 49:1059.
- Rumsey, T. S., E. E. Williams and A. D. Evans. 1975. Tissue residues, performance and ruminal and blood characteristics of steers fed ronnel and activated carbon. J. Anim. Sci. 40:473.
- Salisbury, G. W. and N. L. Van Demark. 1961. Physiology of Reproduction and Artificial Insemination of Cattle. W. H. Freeman and Company, San Francisco and London.
- Steel, R. G. D. and J. H. Torrie. 1960. Principles

- and Procedures of Statistics. McGraw-Hill Book Co., Inc., New York.
- Thomas, O. O. and D. R. Ware. 1978. Performance of feedlot cattle fed ronnel. J. Anim. Sci. 47 (Suppl.1):442(Abstr.).
- Wooden, G. R. and J. W. Algeo. 1977. Effects of ronnel on feedlot performance of beef cattle. J. Anim. Sci. 45 (Suppl.1):269(Abstr.).