

DECCOX-MINERAL FEEDING STUDIES--OKMULGEE COUNTY, OKLAHOMA

K.C. Barnes¹, K.S. Lusby^{2,4}, Fred Still³
and D.R. Taylor⁴

Story in Brief

Two trials with 100 heifers each were conducted to determine the effectiveness of Deccox (decoquinat), a coccidiostat, on sickness and weight gain of newly-arrived stocker cattle. Studies were conducted from November to February on a ranch near Okmulgee, Oklahoma. Deccox-fed heifers gained about .5 lb/day faster ($P < .01$) and had less sickness than Control heifers. Some bloody stools, indicating coccidiosis, were noted for Control heifers in both trials.

(Key Words: Deccox, Coccidiosis, Beef Cattle.)

Introduction

Coccidiosis is a common occurrence among newly arrived cattle on Oklahoma cattle operations. The infection causes economic losses from death loss, high labor and treatment costs and poor performance of some cattle following recovery. Chronic infections may occur in all seasons of the year but are more frequently seen during the fall and winter. There is some evidence that sub-clinical levels of coccidiosis can reduce performance as well as increase susceptibility to other diseases. It is often difficult to administer anticoccidial agents to cattle that are not normally fed supplemental feed or maintained at locations where treatment through feed or water is possible. In these circumstances, administration of an anticoccidial drug through self-fed mineral mixes might be an efficient and economical means of protecting cattle from both clinical and sub-clinical coccidiosis. The following trials were conducted to study the effectiveness of Deccox when self-fed in a mineral mix during the receiving period on the performance and health of newly arrived stocker calves.

Materials and Methods

Two field trials were conducted in Okmulgee County, Oklahoma, approximately 35 miles south of Tulsa in East Central Oklahoma. Cattle and land were provided by Mr. Fred Still and the studies were supervised by Kent Barnes, Area Livestock Specialist, located in Muskogee and Don Taylor, Okmulgee County Extension Director.

Trial 1

One hundred and one heifers were purchased from auction barns and local ranches and were received in four groups over a 2 week period on November 21, November 24, November 29 and December 6, 1983. Average

¹Area Livestock Specialist ²Associate Professor ³Rancher,
Okmulgee, Oklahoma ⁴Extension Director, Okmulgee County

weight was 394 pounds. Each load was randomly split into two treatments, Deccox or Control. Heifers were individually weighed when received, mid-way through the trial and again at the end of the trial, about 58 days from the start. All heifers were vaccinated for IBR-PI3 (IM), Lepto, Blackleg (3-way), wormed with tramisol, treated with systemic grubicide and implanted with ralgro. Each heifer was branded, ear notched, and number tagged for identification. Cattle with horns were tipped.

Heifers were confined by treatment in receiving traps about 10 acres in size and fed ad libitum low quality grass hay and 2 pounds of a 38% protein supplement. The feeding program was designed to minimize purchased feed and provide for daily gains in the .5 to .75 lbs/head/day range. Heifers were observed daily and pulled for treatment when depression, respiratory distress, scouring or other obvious clinical signs were noted. Treatment regimes recommended by the consulting veterinarian were followed.

A commercial mineral mix (Table 1) was offered to all cattle throughout the length of the trial in whirlwind feeders equipped with rubber pans. Deccox was hand mixed into one mineral mix (1.5 lbs. of 6% Deccox premix per 50 lb of mineral) to deliver at least 23 mg. of decoquinatate/100 lb of body weight if anticipated intake occurred (.2 to .3 lb/head/day).

Table 1. Ingredient composition of mineral mix.

Ingredient	lb/ton batch	Percent
Dicalcium phosphate	650	32.5
Salt	300	15.0
Limestone	250	12.5
Corn, ground	300	15.0
Cottonseed meal	300	15.0
Alfalfa pellets, ground	100	5.0
Molasses	100	5.0
Vitamin and trace mineral premix	10	10 lb/ton
Vitamin A, D and E	2	2 lb/ton

To test the consistency of mixing, mineral samples were collected during the course of the study and analysed for decoquinatate at Hess and Clark Analytical Lab, Walland, Ohio. Mineral intake was measured weekly with cottonseed meal added (5-20%) and feeder locations adjusted when needed to induce adequate intake of mineral.

Trial 2

One hundred heifers were purchased from auction barns and received in four groups over a 4 week period on December 10, December 31, January 1 and January 7, 1983-1984. Average weight was 383 pounds. Experimental procedure was the same as in Trial 1 except for a period of 5 days in mid-January. Extreme cold with snow and ice was encountered during the first few days that this group of calves was assembled. Ice had to be chopped on watering ponds and the calves probably consumed minimal water. As a result of weather conditions and/or animal preference, mineral consumption by both Control and Deccox calves was inadequate. In order to insure adequate Deccox intake, Deccox was hand mixed with

cottonseed meal into the protein supplement and fed in addition to the medicated mineral.

Results and Discussion

Trial 1

Results are shown in Table 2. Mineral consumption averaged 1.94 oz./head/day and calculated Deccox consumption averaged 92 mg/head/day during the trial. Mineral consumption varied with daily intakes of Deccox ranging from 38 mg up to 166 mg. Laboratory analyses showed that actual Deccox concentrations in mineral mixes exceeded the calculated amount in every sample taken.

Table 2. Performance of heifers in Trial 1.

	Control	Deccox
Number of Heifers	50	51
Start weight, lbs.	388	400
Daily gain, 1st. period (32 days)	.73	.80 _b
Daily gain, 2nd. period (26 days)	-.14 ^a	.78 _b
Daily gain, total period (58 days)	.34 ^a	.79 _b
Final weight	408	446
Sick pulls, % ^C	54	38
Repulled, %	60	10
Sick pulls with scours, %	100	10
Dead, %	0	0

^{a,b} Means differ (P<.01)

^C One sick pull signifies that a calf was removed for treatment and treated until deemed well.

Daily gains were similar for both Control and Deccox heifers (.73 vs .80 lbs./day) during the first 32 days of the study, which would have mostly taken place in December. However, during the final 26 days, Deccox heifers gained .78 lbs./day compared to -.14 lbs./day for Control heifers (P< .01) For the entire 58 day period, Control heifers gained .34 lb/day compared to .79 lb/day for Heifers receiving Deccox (P< .01). The increased weight gain for the Deccox-fed heifers was readily apparent in the physical appearance of the calves.

More Control heifers were pulled for treatment than Deccox heifers (54% vs 38%) and more Control heifers had to be repulled at a later date for additional treatment (60% vs 10%). The primary reason for sickness in both groups of heifers was respiratory disease. Clinical coccidiosis did not appear to be a major problem with either group of heifers although some bloody stools were noticed in the Control group. It is interesting to note that 100% of the Control heifers that had to be treated for sickness showed scouring compared to 10% for Deccox heifers. Since the diet for the heifers was 2 lbs. of a soybean meal-cottonseed meal pellet and free choice medium to low quality grass hay, there is little reason to suspect that the diet could have been responsible for any scouring. The increased weight gain and the reduced incidence of

scouring seen with heifers fed Deccox and the presence of some bloody stools in the Control group suggests that subclinical coccidiosis may have been a problem in these heifers. No death loss was seen in Trial 1. The pronounced difference in gains between treatments during the second period suggests that some stress was affecting the heifers and the extreme cold weather encountered in late December and early January may have been enough additional stress to retard performance of the Control group.

Trial 2

As was stated in the Materials and Methods section, heifers in this trial were received during a period of extreme cold and it was not possible to achieve adequate Deccox intake through the mineral mix. Palatability of the drug did not appear to be the problem because Control mineral mix was not consumed either. For a 5 day period, additional drug was administered in cottonseed meal blended with the regular protein supplement. After this 5 day period the drug was again fed with the mineral mix. Medicated mineral was available throughout the trial, and consumption averaged 1.66 oz./head/day. Calculated Deccox intake averaged 86 mg./head/day but ranged from 0 to 135 mg./head/day at weekly measurements.

Mineral delivery of any product must be monitored closely with preparations made for altering the palatability of the mineral mix to either increase or reduce intake and to use some other delivery system if adequate mineral intake is not possible. The emergency delivery system used in this study was a small supply of sacked cottonseed meal that could be hand mixed with the drug and substituted for a portion of the regular protein supplement.

Cattle performance is shown in Table 3. During the approximately 57 day trial period, Control heifers lost .03 lbs./day compared to a gain of .57 lbs./day for Deccox heifers ($P < .01$). In contrast to Trial 1, a

Table 3. Performance of heifers in Trial 2.

	Control	Deccox
Number of Heifers	49	51
Start weight, lbs.	397	379
Daily gain, 1st period (29 days)	.09 ^a	.66 ^b
Daily gain, 2nd period (28 days)	-.15 ^a	.47 ^b
Daily gain, total period	-.03 ^a	.57 ^b
Final weight	396	412
Sick pulls, % ^C	65	16
Repulled, %	30	60
Sick pulls with scours, %	100	100
No. dead	2	1

^{a,b}Means differ ($P < .01$)

^COne sick pull signifies that a calf was removed for treatment and treated until deemed well.

highly significant gain advantage was seen for Deccox heifers during the first half of the trial as well as during the second half. Gains for Control heifers were poor (.09 lbs./head/day) for the first 29 days of the study and weight loss was seen during the final 28 days (-.15 lbs./head/day). Heifers receiving Deccox gained .66 lbs./day for the first 29 days and .47 lbs. for the final 28 days.

Clinical coccidiosis was noted in the Control group. As was the case in Trial 1, more Control heifers than Deccox heifers were pulled for treatment (65% vs 16%) although scours was noted in most of the sick heifers from both groups. More Deccox heifers had to be repulled for treatment than Control heifers although the low number of sick heifers in the Deccox group limits interpretation about the relationship between coccidiostat and retreatment of sick cattle in this trial. It is likely that some heifers may not have received sufficient drug during the first few days of the study because of previously noted difficulties with mineral intake during the early part of Trial 2. Two heifers died in the Control group compared to one in the Deccox group. The low mortality in comparison to the high morbidity (sickness) rate, especially in the Control group was a reflection of the excellent treatment received. This level of morbidity would likely result in a higher death rate in many circumstances.

Conclusions

Mineral mixes may be used to deliver Deccox to newly arrived cattle providing the intake is carefully monitored and preparations are made for altering the palatability of the mineral mix and for delivering the drug through some other feed source if mineral intake is not adequate. In a total of 4 trials at this ranch, 2 in the spring and the 2 winter trials reported here, mineral consumption was adequate in 3 of the 4 studies.

A significant gain response was seen in both winter trials as well as a reduction in the number of cattle treated for sickness. Clinical coccidiosis was seen in both studies and the degree of scouring noted suggested that subclinical coccidiosis could have been a problem. Coccidiosis is very common in the fall and early winter in stressed calves. Prevention of the disease with coccidiostats is an obvious recommendation and mineral delivery of coccidiostats may be an additional management tool in situations where the feeding program limits the number of feeds that can be stored and fed. Consumption must be monitored, however, and alternate feeding plans available.