EFFECTS OF AUREOMYCIN, DELIVERED THROUGH THE DRINKING WATER, ON SHIPPING STRESSED STOCKER CATTLE

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Story in Brief

One hundred seventy four head of crossbred shipping-stressed steer calves averaging 288 lbs were used to evaluate the efficacy of Aureomycin (American Cyanamid Co. Wayne NJ) a water soluble antibiotic used in a mass medication program. Aureomycin significantly increased average daily gain (1.03 vs .77), decreased morbidity (62.06 vs 80.95) and improved feed /gain (9.48 vs 12.99) over controls. Based upon the results of this study Aureomycin may provide an effective labor saving means of mass medicating "high-risk" receiving cattle.

(Key Words: Shipping-Stressed, Calves, Aureomycin.)

Introduction

Bovine Respiratory Disease complex is a serious economic problem faced by producers receiving shipping stressed stocker cattle. Mass medication is recommended for receiving cattle expected to have high morbidity. The predominant means of administering mass medication is via either injectable or feed grade antibiotics. Due to concerns of injection site lesions, the use of injectable products should be minimized. Feed grade antibiotics fed at therapeutic levels can inhibit ruminal microflora essential for normal rumen function and utilization of fibrous feeds. Water soluble compounds may offer a solution to both problems. Researchers at Oklahoma State University have shown that as much as 60 - 80% (Garza and Owens, 1989) of the water consumed by cattle may bypass the rumen and arrive directly in the abomasum. If antibiotics placed in the drinking water can be delivered directly to the abomasum, then both the problem of injection site lesions and destruction of ruminal microflora could be avoided. In addition, stressed calves may not consume much feed for several days unlike water that is typically consumed

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shortly after arrival, hence antibiotics delivered via the drinking water will benefit the animal sooner.

Materials and Methods

One hundred seventy four crossbred steer calves originating from Florida and averaging 288 lbs were received at the research station in Pawhuska, OK in September 1992. After unloading, the cattle were weighed, identified, and randomly allotted to pens. Prior to the arrival of the cattle, drinking water in half of the pens was treated with Aureomycin (American Cyanamid). The drinking water was medicated for five consecutive days at a rate of 25.6 g chlortetracycline-HCl per 25 gallons. All cattle were rested and allowed free choice to hay and water for one day. On the following day, all animals were processed as follows: vaccinated with IBR-PI3-BRSV (modified live virus; i.m.) and 4-way clostridial bacterin and dewormed with ivermectin. At 14 days, the cattle recieved a booster of IBR-PI3-BRSV and were vaccinated with a Leptospira Pomana Bacterin. All pens calves were limit fed a ration (table 1) at 3 % of body weight to attain a maximum animal daily gain of .75 lb. This ration consisted of 2 lbs of protein pellets with the remainder being prairie hay.

Calves were monitored twice daily for sickness (rectal temperature > 104^{o}F, or visually depressed). Sick animals were treated daily with antibiotics until rectal temperature was < 104^{o} For two consecutive days and visual signs disappeared. At the end of the 28 day study, cattle were held overnight without feed or water and weighed the following morning.

Results and Discussion

The recommended daily dosage of aureomycin is 2900 mg for a calf of this size. Table 2 illustrates the daily water and medication intake. The average daily medication intake was 3258 mg for the 5 day period; this is 12.34 % higher than the recommended dose. Calves in this study were received from Florida; water intakes may have been high the first few days due to restoring of lost body fluids.

The health and performance parameters are summarized in table 3. Aureomycin increased ($P<.03$) daily gains (1.03 vs .77), and ($P<.01$) feed /gain (9.48 vs 12.99) over controls. Feed intakes were similar between aureomycin and controls (9.65 vs 9.75) this indicates that the relatively high level of antibiotic in water had no detrimental effects on intake and thereby perhaps on the ruminal microflora possibly because the majority was ruminally bypassed.

Aureomycin ($P<.006$) decreased morbidity by 16.5% over controls. Although Aureomycin did not significantly affect the percent of cattle which had to be repulled it decreased ($P<.008$) the percent of cattle both repulled and

Table 1. Composition of diets (dry matter basis).

Ingredient	
Ration	
Prairie hay, lb	10
Supplement	2
Supplement	% Composition
Soybean meal	55.18
Cottonseed meal	40.00
Salt	3.00
Dicalcium phosphate	1.30
Vitamin A	.11
Vitamin D	.09
Selenium 600	.10
Bovatec 68	.15

Average calculated composition of the ration:

Nutrients	Ration Composition DM basis
NEm, Mcal/cwt	51.00
NEg, Mcal/cwt	25.80
Crude protein, %	12.28
K, %	1.25
Ca, %	.44
P, %	.32

Table 2. Average daily water and medication intake.

Day	Water (gallons)	Medication (mg)
1	4.54	4654
2	3.97	4072
3	3.41	3490
4	2.27	2327
5	1.70	1745

Table 3. Effect of Aureomycin on animal health.

	Control	Aureomycin	SE	Probability
Calves, N	87	87		
Initial Weight	284	290	3.06	.17
Final weight	303	316	5.44	.10
ADG, lb	.77	1.03	.086	.03
Morbidity, %	80.95	62.06	4.85	.006
Response, %[a]	52.94	59.26	6.8	.48
Repull, %[b]	26.47	35.19	6.28	.30
Repull and Retreat, %[c]	16.18	1.85	3.97	.008
Dead, %	1.19	1.15	1.18	.98
Feed Intake, lb	9.75	9.65	.14	.62
F/G	12.99	9.48	.72	.01

[a] Response is the percent of sick cattle that only required one treatment.

[b] A repull is defined as a calf that had a break in treatment days between initial and subsequent treatments.

[c] A repull and a retreat is defined as a calf that was pulled for signs of illness more than once and also required more than one drug treatment.

treated with more than one drug by (1.8 vs 16.2). This study demonstrates that a water soluble antibiotic can effectively be used in a mass medication program to decrease morbidity and improve gains while not depressing feed intakes.

Literature Cited

Garza-F, J.D. and F.N. Owens. 1989. Quantitative origin of ruminal liquid with various diets and feed intakes. Okla. Agr. Exp. Sta Res. Rep. MP-127:84.