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EFFECT OF AGRADO ON THE HEALTH AND PERFORMANCE OF TRANSPORT-STRESSED HEIFER CALVES

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Story in Brief

Nine-hundred-six mixed breed heifer calves (427 lb average initial BW) were fed to determine the effect of adding Agrado™[6], an antioxidant, to the receiving ration on rate and efficiency of gain, and response to medical treatments. Each load of cattle was blocked by weight; within each weight block cattle were assigned to one of two diets (0 or 150 ppm added Agrado™) resulting in eight pens per load. All cattle, purchased at sale barns in Oklahoma and Arkansas by order buyers, were given free choice access to a moderately high energy receiving diet (51.35 Mcal Neg/cwt). Health and performance were monitored for 42 d following arrival. Diets were supplemented with 15 IU vitamin E/kg and either 0 or 150 mg Agrado™/kg. Cattle were observed for signs of morbidity daily, and frequency, duration, and extensiveness of medical treatments were recorded. Morbid heifers fed supplemental Agrado™ required fewer medical treatments for recovery, indicating that Agrado™ may reduce medical costs. No effects of Agrado™ supplementation on rate and efficiency of gain during a 42-d receiving trial were detected.

Key Words: Agrado™, Shipping-stessed Cattle, Feedlot

Introduction

Supplementing vitamin E, an antioxidant, at high concentrations in the diet of newly received cattle has been shown to improve daily gains and feed efficiency, and to reduce morbidity during a 28-d receiving period (Hays et al., 1987; Gill et al., 1986). Unfortunately, the cost of supplementing vitamin E is $3 to $4 per animal, which becomes a costly supplement for producers. This led to research done by Krumsiek and Owens (1998) with Agrado™, an antioxidant. They studied the performance and carcass traits of beef cattle supplemented with Agrado™ during the finishing phase of feeding. Krumsiek and Owens (1998) reported that supplementation tended to increase the rate and efficiency of gain. Other than the work by Silzell et al. (1998), no research has been reported on the effects of Agrado™ on health, immune response, and performance of transport-stressed calves. The objective of this trial was to evaluate the effects of Agrado™ supplementation at approximately 150 ppm on the health and performance of transport-stressed receiving heifer calves.

Materials and Methods

Nine truckloads (trials) of cattle were purchased by order buyers from auction markets in Oklahoma and Arkansas and were shipped to the Willard Sparks Beef Research Center, Stillwater, OK. Arrival weight, number of head, cattle origin, arrival date, and transit shrink for each load are summarized in Table 1. Upon arrival at the feedlot, each load of calves was identified with numbered ear tags and weighed individually. Cattle were then placed into a large pen and offered free choice access to long-stem prairie hay and water over night. On the morning after arrival, cattle were processed as follows: 1) individual weights recorded; 2) cattle were vaccinated with BRSV VAC 4®, IM, Vision 7®, SQ, and treated for internal and external parasites using Cydectin®, pour-on; 3) heifers were started on antibiotic treatment if clinical signs of illness were detected; 4) a hospital card was initiated for calves diagnosed as morbid; 5) allocation based on arrival weight, to assigned pens; 6)

revaccinated with BRSV VAC 4® 14 d post arrival. Cattle were blocked into two weight groups and were assigned into eight pens holding 10 to 16 animals each. Housing consisted of 40' x 100' feedlot pens with fenceline cement bunks. Adjacent pens shared automatic waterers.

Treatment. During the 42-d receiving period, cattle were fed a common starter ration (Tables 2 and 3) that was balanced to NRC (1996) recommendations. Fifteen IU of vitamin E/kg was supplemented to all heifers. Agrado™ was supplemented in a corn-based premix at 0 ppm or 150 ppm levels. Bunks were read at approximately 8:30 a.m., about 1 h before feeding, to determine the amount of feed to be offered that day.

Health Management. After processing, cattle were checked once daily for clinical signs of illness. Animals that were suspected to be sick, were moved to the processing area where body temperature was determined and a severity of illness score (slight, moderate, or severe) was assigned. If body temperature exceeded 104°F the animal was considered "sick". Animals could also be classified as sick based on clinical signs. Morbid animals received medical treatment based on a specified sequence of antimicrobial drugs shown in Table 4. Recovered animals that became sick again were designated as repulls. Following medical treatment heifers were returned to their original pens. During the 42-d receiving period, heifers that were chronically ill and(or) lame were removed from the experiment.

Cattle Weighing. Heifers were weighed and recorded (individual and platform by pen) on d 0, 14, 28, and 42 of the trial. At the end of the 42-d receiving period, the cattle were taken off feed and water for approximately 16 h before the last weight was taken.

Results and Discussion

Feedlot Performance. Performance of the cattle that gained more than 0.25 lb/d is summarized in Table 5. Average Daily Gain tended to be slightly higher (P=0.2) for the Agrado™ cattle the first 14 d of the receiving period, although there was no significant difference between Agrado™ and control cattle in ADG through the trial. The Agrado™ supplementation did not significantly affect DMI. However, due to the slightly higher ADG in the first 14 d, G:F ratio also tended to increase (29.28 vs 27.53 lb of gain/100 lb of feed, respectively). There was no significant difference between treatments in feedlot performance for the entire trial.

Health Performance. The influence of Agrado™ on health and morbidity is summarized in Table 6. Agrado™ decreased overall morbidity from 69 to 62% (P=.06). Since most of the cattle were detected as sick in the first 5 d, before any feed additive could have an effect, the data were analyzed excluding cattle that become sick in the first 5 d. When the cattle were detected as sick in the first 5 d were excluded, Agrado™ reduced the average number of medical treatments (1.03 vs 1.18). Adding Agrado™ to the receiving diet could prove to be beneficial to producers by improving cattle health and reducing the medical costs. However, it is not clear whether Agrado™ could replace the other antioxidants to improve the immune function. Further study is needed to investigate the function of Agrado™ at different levels in cattle.

Literature Cited

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Table 1. Origin, arrival date, number of head, arrival weight, and in-transit shrink for each load of cattle.

Trial	Origin	Arrival date	Number of head	Arrival wt, lb	% Shrink
1	OK	9-10-98	90	472	1.1
2	OK	9-20-98	92	471	1.0
3	OK	9-29-98	90	472	1.0
4	OK	10-05-98	79	510	1.0
5	OK	10-29-98	111	383	1.0
6	OK	11-04-98	125	378	1.0
7	AR	11-21-98	103	418	1.0
8	AR	1-22-99	108	386	1.0
9	OK	1-23-99	108	400	1.0

Table 2. Composition of diets on a dry matter basis.

Ingredient	Agrado	Control
Soybean hulls	32.5	32.5
Supplement[a]	30.5	30.5
Corn Dent No. 2	25.0	25.0
Cottonseed hulls	10.0	10.0
Premix[b]	2.0	-
Premix[c]	-	2.0

[a]Supplement composition: Wheat midds 54.37%, cotton seed meal 24.59%, soybean meal (47.5%) 11.48%, limestone 3.6%, salt 0.88%, selenium-600 0.033%, and cane molasses

4.9%. Rumensin was added to provide 22g/ton of ration and vitamin A was added to provide 2500 IU/lb of ration.

[b]Premix composition: Ground corn 87.375%, Agrado™ 1.125%, soybean meal 10%, $CaCO_3$ 1.5%.

[c]Premix composition: Ground corn 88.5%, soybean meal 10%, $CaCO_3$ 1.5%.

Table 3. Calculated composition of diet

	Ration composition	
Nutrients	DM %	As fed %
NEm, mcal/cwt	82.00	74.09
NEg, mcal/cwt	51.35	45.95
Crude Protein, %	15.21	13.61
Crude Fiber, %	21.13	18.91
K, %	1.11	.99
Ca, %	.74	.66
Phos, %	.45	.41
Dry matter, %	100.00	89.48

Table 4. Sequence of drugs (veterinarian prescribed).

Treatment	Drug	Amount mL/cwt	Admin-istered	Active period
No. 1	Micotil (Tilmicosin)	1.5	SQ	48 h
No. 2	Nuflor (Florfenicol)	6.0	SQ	72 h
No. 3	Excenel (Ceftiofur)	2.0	SQ	Two 48-h treatments

Table 5. Effect of Agrado on feedlot performance.

Item	Agrado™	Control	P

Liveweight, lb[a]			
Initial	427.40	427.63	.89
Final	518.54	519.63	.71
ADG, lb			
Day 0 to 14	2.06	1.94	.20
Day 14 to 28	2.39	2.51	.46
Day 0 to 28	2.23	2.22	.93
Day 28 to 42	2.04	2.11	.55
Total[a]	2.16	2.19	.65
DMI, lb			
Day 0 to 14	7.07	7.00	.61
Day 14 to 28	11.59	11.49	.56
Day 0 to 28	9.33	9.25	.55
Day 28 to 42	13.63	13.65	.88
Total	10.76	10.71	.73
GF, lb[b]			
Day 0 to 14	29.28	27.53	.19
Day 14 to 28	20.75	21.89	.40
Day 28 to 42	14.82	15.39	.54
Total[a]	20.20	20.44	.51

[a]Weight based on shrunk weight.

[b]Lb of gain/100 lb of feed.

Table 6. Effect of Agrado on health performance.

Item	Agrado™	Control	P
Morbidity, %[a]	62	69	.06
Morbidity, %[b]	15	21	.05
Medical treatments[c]	1.03	1.18	.05
Repull[d]	.11	.10	.53
Mortality, %	.88	1.10	

[a]All cattle included.

[b]Cattle that became sick after fifth day of trial only.

[c]Number of drug treatments required to cure the first illness.

[d]Recovered animals that became sick again.