

THE EFFECT OF PROBIOTIC FEEDING ON HEALTH AND PERFORMANCE OF NEWLY-ARRIVED STOCKER CALVES

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Story in Brief

Three hundred seven newly-received steer and bull calves and yearlings were used in four replicated experiments to determine the effect of a probiotic fed continuously in the protein supplement during the test period on performance and health. Daily gains were increased from 1.65 to 1.75 pounds per day, morbidity was reduced from 41 to 36 percent and sick days decreased from an average of 1.35 to 1.21 with the feeding of the probiotic. The Fastrack brand of probiotic was added to provide the calves with 1.4×10^9 live bacteria per day in the feed supplement. The results of this experiment suggest that the addition of the culture to the feed had a desirable effect on the calves during the receiving period.

(Key Words: Probiotic, Stressed Cattle, Shipping Fever.)

Introduction

Newly-received stocker calves undergo a variety of stresses such as fasting, transporting, assembly, vaccination, castration and dehorning. These stresses may alter the gut microflora (Williams and Mahoney, 1984) reducing the beneficial gut bacteria which results in decreased performance and increased morbidity and death loss. One means of overcoming these changes in the gut microflora population is through the administration of microbial cultures which can repopulate the gut. As part of ongoing stressed cattle and shipping fever research, calves were randomly selected from four loads of calves to study the effect of Fastrack, a microbial culture, on the health and performance of newly arrived stocker and feeder calves.

Materials and Methods

All 307 calves (steers and bulls averaging 516 pounds) were purchased by order buyers from auction markets in Oklahoma and shipped by truck to the Pawhuska, Oklahoma Research Station in January and February, 1986. On arrival the newly-received calves were weighed individually, ear tagged and randomly divided into four pens except for the last load which was divided into two pens. Four different truck loads arriving on January 14 through February 22, 1986 were used. An equal number of pens received either a control feed (Table 1) or this feed with Fastrack added. Both the control and the treatment feed contained 50 mg of decoquinate per pound. These feeds were provided at a rate of two pounds per head per day for the first 21 days of the trial, and one

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Table 1. Composition of feed supplement containing the probiotic.

Ingredient	Percent as Fed
Soybean Meal	87.10
Fastrack premix ¹	1.75
Salt	3.00
Vitamin A-30,000 IU/gram	.22
Deccox premix ²	.18
Cottonseed meal	5.00
Dicalcium phosphate	2.75

¹To provide $.7 \times 10^9$ live bacteria /lb. Fastrack brand of microbial culture manufactured by Conklin Company Inc., 889 Valley Park Drive, Shakopee, MN 55379.

²To Provide: 50 mg Decoquinat/lb.

pound per day daily for the next 7 days. During last 7 days one pound of the cattle owners 41% protein range cubes were fed per head daily. Water and native bluestem grass hay were available in the pens free choice. The morning following arrival, the calves were processed as follows:

1. Body temperature and time were recorded.
2. All calves were vaccinated with IBR-PI₃ (MLV) IM, Leptospira Pomona bacterin and Clostridia chauvoei, septicum, novyi and sordellii bacterin.
3. All calves were wormed with ivermectin.
4. Calves were started on antibiotic treatment if clinical signs of illness were detected or if body temperature exceeded 104F.
5. For sick calves, a hospital card was initiated and the animal was placed in a hospital pen.

After processing, calves were checked twice daily for signs of illness. If an animal was suspected to be sick, it was taken to the processing area where its body temperature was measured and a severity of illness score (slight, moderate or severe) was assigned. If the body temperature exceeded 104F, the animal was considered sick. The animal also could be classified as sick based on clinical signs.

Treatment schedules were a sequence of antimicrobial drugs listed in Table 2. Calves were treated first with the first drug in the sequence. If the body temperature dropped 2F or to less than 104F, or clinical signs were improved within 24 hours, the drug was continued. If there was no response the next drug in the sequence was applied. This procedure was repeated until an improvement was detected. This procedure is outlined in OSU RP-9104-04/81. At the end of the 28 day trial, the calves were held overnight without feed or water, and weighed the following morning. When necessary, calves were castrated and horns were tipped. Calves were then returned to their owner.

Results and Discussion

Least square means for gains, feed intake, feed efficiency, morbidity and treatments per head purchased are presented in Table 3. Daily gains were increased by 9.3% with the addition of the inoculum to the feed (1.51 vs 1.65 lb) and feed efficiency was increased ($P < .05$) by 9.5% (10.27 vs 9.29 lb feed/lb gain). Feed intakes were not affected by

Table 2. Sequence of drugs¹ used for treatment of BRD in 1986 experiments.

Treatment No 1:	<u>OXYTETRACYCLINE</u> (Terramycin-100) subcutaneously -5 mg/lb. Plus <u>SULFAMETHAZINE BOLUSES</u> (15 gm) 1 bolus/150 lb. on day 1. One bolus/300 lb. on subsequent days
Treatment No 2:	<u>ERYTHROMYCIN</u> (Gallamycin) deep in the muscles 10 mg/ lb.
Treatment No 3:	<u>SPECTINOMYCIN</u> (Spectam) 10 mg/lb.
Treatment No 4:	<u>Procaine Penicillin G</u> subcutaneously 30,000 IU/lb.
Treatment No 5:	<u>Tylan 200</u> 10 mg/lb.

¹ Some of the antimicrobial drugs used in this study were used for extra-label purpose or at extra-label dosages and require a veterinarian-client-patient relationship before use.

Table 3. Effect of Fastrack on performance and morbidity of stressed calves.

	Controls	Fastrack
Number head	153	154
Number pens	7	7
Daily gain, lb	1.51 ^a	1.65 ^b
Feed intake, lb	15.52	15.34
Feed/gain	10.27 ^b	9.29 ^a
Morbidity, %	41.1 ^b	36.6 ^b
Treatments/head purchased	1.4	1.2

^{a,b} Means within same row with different superscripts differ ($P < .05$).

the treatment. The incidence of sickness was reduced ($P < .05$) by 10.9% with the inoculum (41.1 vs 36.6%). The results of this study suggest that the addition of this inoculum to the diet can improve performance and health of stressed stocker calves. In a previous study (Hicks et al., 1986), a probiotic gel administered at the time of processing gave less favorable results, possibly because a single inoculation may not be adequate for stressed calves.

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