THE EFFECT OF A MICROBIAL CULTURE ON HEALTH AND PERFORMANCE OF NEWLY-ARRIVED STOCKER CATTLE

R.B. Hicks[1], D.R. Gill[2], R.A. Smith[3], and R.L. Ball[4]

Story in Brief

Newly-received heifer, steer and bull calves and yearlings (437) were used in four experiments to determine the effect of a microbial culture (Probios®) on performance and health. In each experiment, one group of cattle received routine processing while the other group received routine processing plus the microbial culture. The effects of the microbial culture were not consistent between experiments. These tests failed to detect statistically significant benefits for treating newly received, stressed stocker cattle with a microbial culture at the time of processing. However, there was a trend toward reduced morbidity and slight increases in gain in three of the four experiments.

(Key Words: Newly Received Cattle, Stressed Cattle, Probios®, Microbial Culture)

Introduction

Newly-received stocker calves undergo a variety of stresses such as fasting, transport, assembly, vaccination, castration and dehorning. Such stresses can alter the rumen microflora population (Williams and Mahoney, 1984) resulting in decreased performance and increased morbidity and death loss. Administration of microbial cultures (MC) to repopulate the gut may overcome these changes in the rumen microflora population. Probios® is a microbial culture containing three species of live Lactobacillus bacteria (Lactobacillus acidophilus, plantarum and casei) and one species of Streptococcus bacteria (Streptococcus faecium). Probios® gel administered at processing and fed in the receiving diet for 28 days has reduced morbidity by 28% (Hutcheson et al., 1980) and by 69% (Davis, 1982). Davis (1982) reported that morbidity was reduced by 50% with Probios® gel alone. This study was conducted to determine the effect of a microbial culture on the health and performance of newly arrived stocker and feeder cattle.

Materials and Methods

All cattle were purchased by order buyers from auction markets in Mississippi or Oklahoma City, and shipped by truck to the Pawhuska, Oklahoma Research Station. Animals from five different truckloads were used in trials starting February 16, 1985 (Exp. 1), March 20 and 27, 1985 (Exp. 2), September 12, 1985 (Exp. 3) and October 14, 1985 (Exp. 4). Newly-received cattle were weighed individually off the truck, ear tagged and treated with Lysoff®[a] in experiments 1, 2 and 3. After

[1]Graduate Assistant [2]Regents [4]Professor [3]Associate Professor, Veterinary Medicine and Surgery [4]Herdsman II
[a]Cutter Laboratories, Shawnee Mission, KS 66201.

weighing and tagging, cattle were placed in pens of 20 to 25 animals each, depending on the number of cattle received. Water and native bluestem grass hay were available free choice. The morning following arrival, cattle were processed as follows:

1. Body temperature and time were recorded.
2. All cattle were vaccinated with IBR-PI$_3$ (MLV) IM, *Leptospira pomona* bacterin and *Clostridia chauvoei*, *septicum*, *novyi* and *sordellii* bacterin.
3. One-half the cattle were treated with Probios®[b] while the others were not treated.
4. Exp. 1: As part of a deworming study superimposed across this experiment, cattle with odd-numbered ear tags were dewormed with ivermectin while those cattle with even-numbered ear tags served as controls .
   Exp. 2: As part of a deworming study superimposed across this experiment, cattle were dewormed with ivermectin[c], fenbendazole[d], levamisole phosphate[e] or nothing.
   Exp. 3: All cattle were dewormed with fenbendazole.
   Exp. 4: All cattle were dewormed with ivermectin.
5. Calves received antibiotic treatment if clinical signs of illness were detected or if body temperature exceeded 104°F.
6. Sick calves were placed in a hospital pen and hospital cards were initiated.

Bluestem hay was available at all times and a supplement containing lasalocid or decoquinate (Table 1) was offered at a rate of 2 lb/hd/day for the first 21 days and 1 lb/hd/day during days 22-28.

After processing, cattle 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 determined and a severity of illness score (slight, moderate or severe) was assigned. If the body temperature exceeded 104°F, the animal was considered to be sick. The animal also could be classified as sick based on clinical signs alone.

Table 1. Composition of feed supplement.

Ingredient	Percent, as fed
Soybean meal	88.9
Salt	3.0
Vitamin A-30,000 IU/gm	.22
Premix[a]	.18
Cottonseed meal	5.0
Dicalcium phosphate	2.75

[a]To provide 50 mg decoquinate/lb in Exp. 1, 2 and 3 or 75 mg lasalocid/lb in Exp. 4.

[b]Pioneer Hi-Bred International, Inc., Johnston, IO 50131.
[c]Ivomec®, MSD Agvet, Rahway, NJ 07065.
[d]Panacur®, Hoechst-Roussel Agri-Vet Company, Somerville, NJ 08876.
[e]Tramisol®, Cyanamid Agricultural De Puerto Rico, Inc., Manati, Puerto Rico 00701.

Medical treatment for sick animals was determined by the ear tag number which was applied at random on arrival. In Exp. 1, 2 and 3, treatment schedules were a sequence of antimicrobial drugs (Schedule A; Table 2) or an experimental potentiated sulfa drug (RO5-0037[f]) substituted for treatment 1 in Table 2 (Schedule B). In Exp. 4, treatment schedules were Schedule A or A with treatments 1 and 3 switched (Schedule C). Initially cattle were treated with the first drug in the sequence. If body temperature dropped 2°F or to less than 104°F, or if clinical signs improved within 24 hours, the first drug was used for two additional days. If no improvement was apparent within 24 hours, the next drug in the sequence was applied and the procedure was repeated until improvement was detected. Cattle treated by schedule B received RO5-0037 boluses orally (30 mg/lb on the first day and 15 mg/lb/day thereafter).

At the end of the 28 day trial, cattle were held overnight without feed or water, weighed the following morning and, as necessary, cattle were castrated and horns were tipped. Cattle were then returned to the owner.

Table 2. Sequence of drugs used for treatment of BRD.

Treatment No. 1:	OXYTETRACYCLINE (Biomycin-C®) subcutaneously - 5 mg/lb. PLUS SULFAMETHAZINE BOLUSES (15 gm) 1 bolus/150 lb on day 1. One bolus/300 lb on subsequent days.
Treatment No 2:[1]	ERYTHROMYCIN (GALLAMYCIN®) deep in the muscles - 10 mg/lb.
Treatment No 3:[1]	SPECTINOMYCIN (Spectam®) 5mg/lb IM.
Treatment No 4:[1]	PROCAINE PENICILLIN G - Subcutaneously - 30,000 IU/lb.
Treatment No 5:[1]	TYLAN 200 - 10 mg/lb IM.

[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.

Results and Discussion

Least square means for gain, morbidity and sick days are presented in Table 3. No statistical differences (P>.05) were observed in any of the experiments. The effects of MC on daily gains were inconsistent between experiments. In Exp. 1, cattle did not maintain weight gain throughout the 28 day period due to a shortage of hay near the end of the trial . However, cattle receiving MC gained 0.15 lb/day compared to 0.31 lb/day loss for control cattle. Weight gains were not affected by MC in Exp. 2, whereas, gains in Exp. 3 were 61.3% greater with MC (.75 vs 1.21 lb/hd/day). Gains were slightly lower with MC treatment in Exp.

[f]Primor®, Hoffman-LaRoche, Inc., Nutley, NJ 07110.

Table 3. Effect of microbial culture on performance and morbidity of stressed calves.

	Head No.	Daily Gain, lb	Morbidity %	Sick Days
Experiment 1				
Control	34	-0.31	50.5	2.6
MC	36	0.15	30.1	1.5
Experiment 2				
Control	88	1.27	9.9	0.5
MC	88	1.33	5.1	0.2
Experiment 3				
Control	46	.75	66.8	5.2
MC	44	1.21	80.1	5.2
Experiment 4				
Control	50	2.05	81.7	4.4
MC	51	1.81	69.0	4.2

4. Morbidity was reduced by 40.4, 48.5 and 15.5%, respectively, in Exp. 1, 2 and 4, by treatment with MC, whereas, in Exp. 3 MC increased morbidity by 19.9%. The number of sick days per animal purchased was lower with MC in Exp. 1 and 2, though, in Exp. 3 and 4 MC did not affect number of sick days. There was a 1% death loss in Exp. 4 and no death loss occurred in the other trials. Experience with this type of research with over 50 groups of cattle over the past few years has made the research team aware of the fact that with the 437 head of cattle used in this experiment that it is very unlikely that a treatment like MC could have a statistically significant effect on gain because of the the normal variation in the cattle.

The effects of a product like Probios® should show up in morbidity or sick days. If the cattle are too stale (morbidity over 50%) or very fresh (morbidity under 15%), treatments which are often quite beneficial frequently fail to have any effect on the cattle. Three out of the four groups of cattle in this experiment fell in this class.

Literature Cited

Davis, G.V. 1982. Probios for stressed calves and yearlings. Kansas State Univ. Cattle Feeders Day, Report of Progress. 416:30.

Hutcheson, D.P. et al. 1980. The use of a living, nonfreeze-dried Lactobacillus acidophilus culture for receiving feedlot calves. Proc. Western Section Am. Soc. Anim. Sci. 31:213.

Williams, D.L. and J.H. Mahoney. 1984. Pre-weaning and post-weaning nutrition. Proc. 17th Annual Conv. Am. Assoc. Bovine Pract., p. 98.