THE EFFECT OF RESPIRATORY SYNCYTIAL VIRUS VACCINE ON HEALTH AND PERFORMANCE OF NEWLY-ARRIVED STOCKER CATTLE

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Story in Brief

One-hundred forty one newly-received steer and bull calves and yearlings averaging 475 lb were divided into two groups. Eighty-one received routine processing upon arrival, and 60 received routine processing plus respiratory syncytial virus (RSV) vaccine. Vaccination with RSV vaccine decreased daily gain (1.61 vs 1.35 lb/head). Morbidity was 66% for the RSV vaccine group which was higher ($P<.05$) than for the controls (47%). Sick days also were higher in the RSV vaccine group (6.8 vs 4.3 days/animal). Death loss also tended to be higher in the vaccinated groups (13.3 vs 2.5%). In this study, the use of RSV vaccine was detrimental to health and performance of newly-received stressed calves in this 28 day receiving period.

(Key Words: RSV, BRD, Newly-received cattle, Shipping fever

Introduction

Respiratory syncytial virus (RSV) has been detected in respiratory infections of cattle with severe clinical and pathological features (Rosenquist, 1974) and recent work has suggested that RSV may be associated with the Acute Respiratory Distress Syndrome of calves. Antibody surveys have shown that the virus is common in cattle populations. A modified live virus vaccine was recently introduced onto the market for use in cattle. As part of ongoing stressed cattle and shipping fever research, calves were randomly selected from three loads of cattle to study the effect of RSV vaccine on the health and performance of newly arrived stocker and feeder calves.

Materials and Methods

All cattle were purchased by order buyers from auction markets in Tennessee or Alabama and shipped by truck to the Pawhuska, Oklahoma Research Station. Newly-received cattle were weighed individually off the truck, ear tagged and treated with Lysoff®[a]. Following weighing and tagging cattle were placed in pens of 20 to 25 animals each depending on the number of cattle received. For this study, animals from three different truckloads were used in trials starting on August 18, 1984, October 11, 1985 and November 14, 1984. Water and native bluestem grass hay were available free choice. The morning following arrival, the cattle were processed as follows:

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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. Sixty head were vaccinated with respiratory syncytial virus vaccine[b] and 81 head served as unvaccinated controls.
4. One-half the cattle were dewormed with ivermectin[c], the other half in each vaccination group served as controls as part of a deworming trial superimposed on this study.
5. Calves were started on antibiotic treatment if clinical signs of illness were detected or if body temperature exceeded 104°F except for the one-third of the calves which received no treatment if they became sick.
6. For sick calves, a hospital card was initiated and the calf was placed in a hospital pen.

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

Table 1. Composition of feed supplement.

Ingredient	Percent
Soybean meal	88.9
Salt	3.0
Vitamin A-30000 IU/gm	.22
Premix[a]	.18
Cottonseed meal	5.0
Dicalcium phosphate	2.75

[a]To provide 75 mg lasalocid per pound.

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 sick. The animal could also be classified as sick based on clinical signs.

Medical treatment for sick animals was determined by the ear tag number which was applied at random on arrival. Treatment schedules were (A) no treatment (negative controls), (B) a sequence of antimicrobial drugs listed in Table 2 or (C) an experimental potentiated sulfa (RO5-0037[d]) substituted for Treatment 1 in Table 2. Thirteen control cattle and seven in the RSV vaccine group were randomly assigned to treatment schedule A. Cattle treated by schedules B and C were initially treated with the first drug in the sequence. If body temperature dropped 2°F or to less than 104°F, or clinical signs were improved within 24 hours, the first drug was continued for at least

[b]Bovine Respiratory Syncytial Vaccine (serial number 57), Norden Laboratories, Lincoln, NE.
[c]Ivomec®, MSD Agvet, Rahway, NJ 07065
[d]Primor®, Hoffmann-LaRoche, Inc., Nutley, NJ 07110.

another two consecutive days. If no improvement was apparent within 24 hours, the next drug in the sequence was applied and the procedure repeated until improvement was detected (procedure outlined in OSU RP-9104-04/81). Cattle treated by schedule C received R05-0037 boluses orally (30 mg/lb on day one and 15 mg/lb/day thereafter.

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

All cattle dying during this study were admitted to the Oklahoma Animal Disease Diagnostic Laboratory for gross and histological examination, virus isolation, bacterial culture and antibiotic sensitivity testing.

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

Treatment No. 1:	OXYTETRACYCLINE (Biomycin-C®) subcutanously - 5 mg/lb. Plus SULFAMETHAZINE BOLUSES (Sulmet® - 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 - Subcutanously - 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 are presented in Table 3. Average daily gains (ADG) during the 28 day receiving period were 1.61 lb/day for the controls and 1.35 lb/day for those vaccinated with RSV vaccine. Data from cattle that died during the study were not used to calculate gains. Morbidity was high in both groups, but greater ($P<0.05$) in the group vaccinated with RSV vaccine (66 vs 47%). Number of repulls (cattle that had to be treated more than once for respiratory disease) were higher in the RSV vaccinated group and death loss tended to be increased with the RSV vaccine group (13.33% compared to 2.47%). The death loss percentage among cattle that were treated when they became ill by treatment schedule B or C was 5% in the RSV vaccinated group and 0% in the unvaccinated controls.

Table 3. Effect of RSV vaccine on morbidity, mortality and performance of stressed calves.

	Controls (81 head)	RSV Vaccine (60 head)	Vaccine Effect (%)
Average daily gain, lb	1.61	1.35	-16
Morbidity, %	47.	66.	+59
Repulls, %	26.	37.	----
Sick days	4.3	6.8	+40
Total mortality, %	2.5	13.3	+540
Percent mortality excluding treatment schedule A cattle	0.	5.	----

Under the conditions of this study, health and performance of newly-arrived calves were impaired by treatment with respiratory syncytial virus vaccine. This vaccine offered no economic advantage in processing of stressed calves in this study.

Literature Cited

Rosenquinst, B.D. 1974. Isolation of respiratory syncytial virus from calves with acute respiratory disease. J. Infect. Dis. 130:177-182.