

Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 1 *Cattleman's Day (1993-2014)*

Article 784

1992

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Recommended Citation

Brazle, F.K. (1992) "Effect of long-acting penicillin and Levamisole® on gain and health of stressed calves," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 1. <https://doi.org/10.4148/2378-5977.2187>

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Effect of long-acting penicillin and Levamisole® on gain and health of stressed calves

Abstract

Two studies were conducted to determine the effect of long-acting penicillin and/or levamisole injected at arrival or levamisole injected on day 1 and/or day 7 on the health and gain of newly received, highly stressed, light weight calves. Levamisole injected at arrival reduced ($P < .05$) sickness of newly arrived calves during the first 5 days. However, it did not reduce overall sickness during the receiving period. Long-acting penicillin injected at arrival did not reduce sickness, but did improve ($P < .05$) gain of calves during the growing period. The combination of levamisole and long-acting penicillin or the combination of levamisole on day 1 and day 7 did not reduce morbidity in these highly stressed calves.

Keywords

Cattlemen's Day, 1992; Kansas Agricultural Experiment Station contribution; no. 92-407-S; Report of progress (Kansas State University. Agricultural Experiment Station and Cooperative Extension Service); 651; Beef; Antibiotic; Levamisole; Penicillin; Anthelmintic; Stocker cattle

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EFFECT OF LONG-ACTING PENICILLIN AND LEVAMISOLE® ON GAIN AND HEALTH OF STRESSED CALVES¹

F. K. Brazle²

Summary

Two studies were conducted to determine the effect of long-acting penicillin and/or levamisole injected at arrival or levamisole injected on day 1 and/or day 7 on the health and gain of newly received, highly stressed, light weight calves. Levamisole injected at arrival reduced ($P < .05$) sickness of newly arrived calves during the first 5 days. However, it did not reduce overall sickness during the receiving period. Long-acting penicillin injected at arrival did not reduce sickness, but did improve ($P < .05$) gain of calves during the growing period. The combination of levamisole and long-acting penicillin or the combination of levamisole on day 1 and day 7 did not reduce morbidity in these highly stressed calves.

(Key Words: Antibiotic, Levamisole, Penicillin, Anthelmintic, Stocker Cattle.)

Introduction

Calves transported long distances normally have health problems caused by the stresses of weaning, marketing, co-mingling, and then shipping. Many health products have been tried on highly stressed calves to reduce morbidity.

Antibiotic injections have been used at arrival to reduce sickness of calves transported long distances. Although levamisole® is

commercially marketed as an anthelmintic (dewormer), it has been shown to stimulate the immune system in laboratory animals. The objective of these experiments was to determine the effect of long-acting penicillin and levamisole on the incidence and severity of health problems in calves purchased in the southeastern United States and transported to eastern Kansas.

Experimental Procedures

In Trial I, 500 mixed-breed steer and bull calves (323 lb) were purchased over a 14-day period in the fall from Tennessee, Arkansas, and Mississippi. The calves were processed at arrival, and the bull calves were surgically castrated. All calves were vaccinated against IBR, BVD, PI₃, and blackleg (7-way), and treated for internal and external parasites with Ivomec®. During processing, the bulls and steers were uniformly allotted to the following treatments: 1) long-acting penicillin (injected subcutaneously at 2.0 ml/100 lb body wt), 2) levamisole (injected subcutaneously at 1.0 ml/100 lb body wt), 3) both long-acting penicillin and levamisole, and 4) unmedicated control.

In Trial II, 437 mixed-breed bull calves (308 lb) were purchased over a 12-day period in the fall from Tennessee and Mississippi. The calves were processed at arrival and surgically castrated. The calves were vaccinated against IBR, BVD, PI₃ and blackleg (4-

¹Appreciation is expressed to Richard Porter, Reading, Kansas, for providing cattle and collecting performance and health data.

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way) and treated for internal and external parasites with Ivomec. The calves were allotted randomly to the following treatments: 1) levamisole on both day 1 and day 7 (injected subcutaneously at 1.0 ml/100 lb body wt), 2) levamisole on day 1 only, 3) levamisole on day 7 only, and 4) no levamisole, control.

During the receiving period, calves were treated when they appeared sick. In both studies, the calves were fed a forage diet of 1/2 alfalfa hay and 1/2 prairie hay, supplemented with .5 lb of a 40% protein pellet and 2.5 lb whole corn daily.

Results and Discussion

In Trial I, levamisole reduced ($P < .05$) sickness of newly received calves during the first 5 days (Table 1). However, no difference occurred among treatments in overall sickness or medication days required per animal purchased. The reduction in sickness for the first 5 days supports evidence that levamisole stimulates the immune system.

The use of long-acting penicillin improved ($P < .05$) gain during the extended growing period but did not reduce sickness or medications required per animal. This may have been caused by a reduction in cattle with chronic, severe lung damage.

In Trial II, levamisole injected on day 1 resulted in less ($P < .05$) sickness and a trend toward fewer medications required during the first 5 days (Table 2), but no difference was observed among treatments for overall sickness or medication requirements per animal purchased. Levamisole had no effect on calf gain. These results agree with the findings of Trial I.

In summary, neither levamisole or long-acting penicillin injected alone or in combination at arrival nor multiple injections of levamisole reduced the overall level of sickness in highly stressed calves. However, long-acting penicillin injected at arrival improved stocker gain during an 111-day growing period.

Table 1. Effect of Levamisole and Long-acting Penicillin on Gain and Health of Newly Received Calves (Trial I)

| Item | Control | Levamisole | Penicillin | Penicillin + Levamisole |
|-----------------------------------|--------------------|--------------------|--------------------|-------------------------------|
| No. calves | 125 | 125 | 125 | 125 |
| Daily gain, lb | | | | |
| Day 1 to 34 | 1.44 | 1.63 | 1.61 | 1.63 |
| Day 34 to 111 | 2.06 ^a | 2.04 ^a | 2.15 ^b | 2.11 ^b |
| Morbidity, % | | | | |
| Day 1 to 5 | 27.50 ^b | 18.50 ^a | 26.50 ^b | 19.00 ^a |
| Day 6 to 34 | 36.50 | 42.50 | 38.60 | 41.00 |
| Day 1 to 34 | 64.00 | 61.00 | 65.10 | 60.00 |
| Medication days/animal purchased: | | | | |
| Day 1 to 5 | .60 ^b | .13 ^a | .73 ^b | .13 ^a |
| Day 6 to 34 | 2.80 | 3.18 | 2.90 | 2.80 |
| Day 1 to 34 | 3.40 | 3.31 | 3.63 | 2.93 |

^{ab}Means in the same row with unlike superscripts are different ($P < .05$).

Table 2. Effect of Levamisole on Gain and Health of Newly Received Calves (Trial II)

| Item | Control | Levamisole injected day1 | Levamisole injected day7 | Levamisole injected day1 & day7 |
|------------------------------|-------------------|--------------------------|--------------------------|---------------------------------|
| No. calves | 110 | 109 | 109 | 109 |
| Daily gain, lb (day 1 to 30) | 1.43 | 1.41 | 1.31 | 1.35 |
| Morbidity, %: | | | | |
| Day 1 to 5 | 11.5 ^b | 4.5 ^a | 10.7 ^b | 5.6 ^a |
| Day 6 to 30 | 39.7 | 46.4 | 42.6 | 46.8 |
| Day 1 to 30 | 51.2 | 50.9 | 53.3 | 52.4 |
| Day 1 to 5 | .14 | .01 | .18 | .13 |
| Day 6 to 30 | 2.64 | 3.04 | 3.16 | 2.55 |
| Day 1 to 30 | 2.79 | 3.05 | 3.35 | 2.68 |
| Mortality, % | 1.2 | 1.0 | 3.1 | 3.6 |

^{ab}Means in the same row with unlike superscripts are different ($P < .05$).