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HEALTH, NUTRITION AND MANAGEMENT PROGRAMS FOR NEWLY-ARRIVED CATTLE (Stocker Research Project)

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Introduction

Oklahoma State University is presently invloved in a cooperative research effort to study methods that reduce death loss, morbidity and treatment cost and increase the productivity of newly-received stocker cattle. This project is possible because of the cooperation of stocker operators who buy cattle in the southeastern U.S. and have a load delivered to the Research Station at Pawhuska. Each load is used for experimental purposes for about one month, then returned to the owner. While at the Station, cattle are involved in studies on health, nutrition and management. Although some of the experimental procedures discussed in this report are not presently recommended for use by producers, they are included to aid in interpreting future progress reports on this research.

General Procedures

On arrival cattle are weighed individually and randomly assigned to 8 groups of about 10 head. Four groups are maintained in drylot pens which provide approximately 400 square feet per head. The remaining 4 groups are pastured in grass traps of 4 acres, providing about 40 times the area per animal as the drylot pens. The cattle in drylot are intensely managed in close confinement and fed a controlled diet. Those in pasture traps are managed less intensively with native grass as the principle feed source.

After cattle arrive, they are permitted to fill on prairie hay before turning to water. They are then rested overnight before processing. During processing all animals are temperatured to detect sickness that is not apparent, and the temperature is recorded for reference. Cattle with illness are treated and confined to sick pens. Healthy cattle are returned to their respective treatment pens after processing. Drylot cattle are observed three times daily for the detection of sickness, while cattle in grass traps are checked twice daily.

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Routine processing of cattle includes collection of blood samples and tracheal bacteriological swabs, eartagging, hot branding, vaccination, worming, lice and grub control, injection of vitamins and implanting. Blood samples and bacteriological swabs are analyzed, and the data recorded for future comparisons of bacteriological, hematological, chemical and serological information.

Treatment of Sick Cattle

When new stocker cattle are sick on arrival or shortly thereafter, there is insufficient time to diagnose the caustive organisms before treatment begins. Thus, in this research project cattle are medicated for general bacterial infections rather than specific diseases.

A systematic approach to treating sick cattle is taken at the Research Station and is outlined in the following text. This procedure was first presented by Dr. C.A. Hjerpe, University of California, at the 1975 Oklahoma Cattle Feeders' Seminar. The key elements in this program are; (1) identifying sick cattle as soon as possible, (2) starting treatment early, (3) keeping accurate and complete records, and (4) evaluating sick cattle daily to see if they are responding to medication.

Body temperature and/or visual signs of illness are used to identify sick animals and to establish the severity of illness. Medication follows a predetermined treatment schedule based on the severity of illness. Cattle judged to be "very ill" are treated according to the schedule in Table 1, and those that are "moderately ill" or "slightly ill" follow the schedule in Table 2.

When an animal starts on medication, improvement must occur within 24 hours, or it is presumed the medication is not effective. If improvement does not occur, treatment is changed to the next drug or combination of drugs on the medication schedule. The advantage of this procedure is that if a disease organism is resistant to certain drugs, medication is changed frequently until an effective drug is found.

Criteria for improvement are body temperature and observed severity of illness. Guidelines for improvement is sick cattle are as follows:

1. In an animal with a temperature of 104^{o}F or higher on the first day of treatment, body temperature is used to monitor change. If temperature does not drop 2^{o} or to less than 104^{o} within 24 hours after treatment, the animal is presumed unimproved and medication changed.

2. In an animal with a temperature of less than 104^{o}F on the first day of treatment, observed severity of illness is used to monitor change. If severity of illness does not lessen within 24 hours, the animal is presumed unimproved and medication changed.

Cattle that improve within 24 hours after treatment are continued on the same treatment until fever, depression, lack of appetite and other clinical signs of illness are absent for two consecutive days. Dosages and methods for adminstration of drugs used in this research are shown in Table 3.

Examples indicating how body temperature and severity of illness are used to evaluate response to medication are shown in Figures 1, 2 and 3. These are actual results from treating sick cattle involved in the project.

Table 1. Medication Schedule For "Very Ill" Cattle

* If animal fails to improve, change to next treatment
* If animal improves on a treatment, continue that treatment until clinical symptoms are absent two consecutive days
* Table 3 contains additional information on drug use

Treatment 1: Oxytetracycline - subcutaneous, 10 cc per 100 lb
plus
Sulfamethazine boluses - oral, 1½ bol. per 225 lb

Treatment 2: Procaine pencillin G - subcutaneous, 10 cc per 100 lb

Treatment 3: Erythromycin - deep in muscle, 10 cc per 100 lb

Treatment 4: Tylosin - in muscle, 10 cc per 100 lb

Treatment 5: Procaine pencillin G - subcutaneous, 20 cc per 100 lb

Treatment 6: Treat for 3 days with oxytetracycline, If no improvement, treat for 3 days with sulfamethazine. If no improvement, treat for 3 days with penicillin. Subsequent treatments should consist of 3 days of sulfamethazine or penicillin.

Table 2. Medication Schedule for "Slightly Ill" or "Moderately Ill" Cattle

* If animal fails to improve, change to next treatment
* If animal improves on a treatment, continue that treatment until clinical symptoms are absent two consecutive days
* Table 3 contains additional information on drug use

Treatment 1: Oxytetracycline - subcutaneous, 10 cc per 100 lb

Treatment 2: Sulfamethazine boluses - oral, 1½ bol. per 225 lb

Treatment 3: Procaine penicillin G - subcutaneous, 10 cc per 100 lb

Treatment 4: Erythromycin - deep in muscle, 10 cc per 100 lb

Treatment 5: Tylosin - in muscle, 10 cc per 100 lb

Treatment 6: Procaine penicillin G - subcutaneous, 20 cc per 100 lb

Treatment 7: Treat for 3 days with oxytetracycline. If no improvement, treat for 3 days with sulfamethazine. If no improvement, treat for 3 days with penicillin. Subsequent treatments if required, should consist of 3 days of sulfamethazine or penicillin.

Table 3. Guidelines on Drug Use

I. Oxytetracycline, 50 mg/cc (Terramycin, Oxyject)

A. Subcutaneous use in cattle with respiratory disease. Use 10 cc/100 lb (5 mg/lb). Inject no more than 10 cc per site.

II. Sulfamethazine -

A. Oral use (15 gram boluses)

1. Use 1½ boluses for every 225 lb for initial treatment (1½ grain/lb).
2. Retreat once daily with 1 bolus for every 225 lb (1 grain/lb).

B. The following precautions should be observed in using sulfamethazine:

1. Do not overdose. Sulfas may be injurious to the kidneys. Closely follow recommended dosages.
2. Don't treat with sulfamethazine for longer than a 7-day period.
3. Avoid use of sulfamethazine in severely dehydrated cattle or in cattle that are not drinking.
4. Do not sell or slaughter for 10 days after the last treatment with sulfamethazine.

III. Procaine penicillin G

Use 10 cc/100 lb (30,000 units/lb) or 20 cc/100 lb (60,000 units/lb) injected subcutaneously. There is no limit on the volume used per injection site. Do not sell or slaughter for 20 days after the last treatment with penicillin.

IV. Erythromycin (Gallimycin)

Use 10 cc/100 lb (20 mg/lb) in treating respiratory disease in new cattle. Inject deep into the muscles of the rump or thigh. Use no more than 10 cc per injection site. Do not sell or slaughter for 20 days after the last treatment with erythromycin.

V. Tylosin (tylan 200)

Use 10 cc/100 lb (20 mg/lb) injected into the muscles of the neck. Use no more than 10 cc per injection site. Do not sell or slaughter for 20 days after the last treatment with tylosin.

Figure 1. An Example Using Body Temperature to Monitor Improvement, Where the Animal Responded Quickly

Animal No. 322 Weight 400 lb

Date	Temp.	Degree of Illness	Oxytet.	Sulfa. Bol.	Pen.	Eryth.	Tylo.
1-13	106.0	Moderate	40				
14	102.1	Slight	40				
15	102.5	Slight+	40				
16	101.8	0	40				
17	101.9	0	40	Released			

When first pulled for examination, this steer had a temperature of 106.0°. He was evaluated as "moderately ill", and medication began according to the schedule in Table 2. Because the steer had a temperature greater than 104° initially, body temperature was used to monitor drug effectiveness.

The first medication with oxytetracycline reduced body temperature from 106.0° to 102.1°. Because his temperature dropped more than 2° within 24 hours, the steer was designated as improved. Treatment with oxytetracycline continued until the animal exhibited near normal temperature and a lack of clinical symptoms for two consectutive days.

Figure 2. An Example Using Body Temperature to Monitor Improvement, Where the Animal Responded Slowly

Animal No. 352 Weight 390 lb

Date	Temp.	Degree of Illness	Oxytet.	Sulfa. Bol.	Pen.	Eryth.	Tylo.
1-10	106.1	Moderate	40	3			
11	105.6	Moderate+			40		
12	105.7	Moderate				40	
13	101.0	Slight				40	
14	102.1	±0				40	
15	102.1	0				40	Released

This steer had a temperature of 106.1° when pulled for examination. He was evaluated as "very ill", and medicated according to the schedule in Table 1. Because he had an initial temperature above 104°, body temperature was used to monitor response to drugs.

Oxytetracycline plus sulfamethazine and penicillin were apparently ineffective, since little reduction in temperature occured when these drugs were administered. Medication was changed daily until erythromycin resulted in notable improvement, a fever drop from 105.7° to 101.0° within 24 hours. Treatment with erythromycin continued until the steer appeared normal for two consectutive days.

Figure 3. An Example Using Observed Severity of Illness to Monitor Improvement

Animal No. 386 Weight 500 lb

Date	Temp.	Degree of Illness	Oxytet.	Sulfa. Bol.	Pen.	Eryth.	Tylo.
1-8	103.3	Moderate	50				
9	103.9	Moderate		3½			
10	102.5	Slight		2½			
11	102.5	Slight+		2½			
12	101.8	±0		2½			
13	102.0	0		2½	Released		

Although this steer's body temperature was only 103.3° when he was first examined, clinical symptoms indicated he was "moderately ill". Since his temperature was below 104° initially, severity of illness was used to follow improvement.

Medication with the first drug on the schedule, oxytetracycline, was apparently ineffective. Treatment with sulfamethazine, however, resulted in marked improvement based on observed clinical symptoms. Since the severity of illness lessened with sulfamethazine, medication with this drug continued until symptoms were absent two consecutive days.

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