Health Nutrition and Management of New Cattle

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Introduction

Losses of newly-received stocker and feedlot cattle in Oklahoma has long been a serious problem. Little or no applied research had been conducted on this problem. About twelve years ago a group of Animal Scientists and Veternarians in California started the first full scale research program on the health, nutrition and management of stressed just-arrived feedlot cattle. About four years ago a project to study methods for reducing losses on shipped in stocker cattle was started by Oklahoma State University at the Pawhuska Station. Inspite of the huge losses suffered by the beef industry due to the shipping fever complex it is still possible to count all of the active applied reseach locations in the United States on one hand.

The major objective of the research on methods of reducing losses on just-arrived shipped in cattle is to find techniques to reduce losses and to increase productivity. Early in the project at Pawhuska emphysis was placed on finding injectable antibiotics which were effective on cattle with shipping fever. The results of this work were summarized into recomendations published in OSU RP-9104 "A Treatment Program For Sick Newly-Arrived Stocker Cattle" Then as now most of the factors which have a significant effect on the success of a receiving program are management. One of the major problems to be addressed when a new load of cattle arrives is to sort out those animals which are sick.

Body Temperature

The electronic themometer is a tool which in theory should be of benefit in detecting animals which have a elevated body temperature because of an infection. What is not widely known is that cattle do not maintain a body temperature with in a very narrow range such as people do. In the normal regulation of body temperature cattle let their temperature fluctuate many degrees rather than expend energy to hold it constant. Normal cattle temperatures may range from about 100 to 108 degrees, and follow a diurnal pattern. The magnatude of the fluctuation is effected by the enviromental temperatures and the adaption of the animals. Another problem in using body temperatures observed at Pawhuska and also reported by Dr. Lofgreen is that with movement or excitement, normal body temperatures rise.

It appears that when normal body temperatures are at their diurnal lows and not elevated by the stresses of movement, animals with elevated temperatures due to infection may be seperated from the normal cattle with a thermometer. At Pawhuska the electronic thermometer has been very usefull when used with the following limitations:

1, Newly-arrived cattle are rested over night before processing.

2, Trailer loads of cattle are rested over night divided into at least four pens of not over 25 head each.

3, Processing and the taking of body temperatures starts at dawn and is completed within three hours.

4, No animal is out of its pen or waiting for processing for over 30 minutes.

5, Extra care is taken to move the cattle through processing with a minimum of excitement or stress, body temperatures are taken when the animal first enters the chute.

6, Under these conditions animals having body temperatures over 104 degrees are designated as sick.

At Pawhuska a number of animals have had radio thermometers implanted in there ears at the point of origin by the USDA. These instruments recorded body temperatures every minute or so through out the day. Some of the animals with the recording theromometers became ill after arrival. While it would simplify management for the cattlemen if a wider window of conditions could be found to use the thermometer it appears unlikely that one will be found. The problem is in that the sick animal does not elevate its body temperature above the high diurnal variation in a consistant manor. The use of the thermometer under conditions which conflict with the above six conditions could give misleading indications. There may be a little more latitude in using the therometer to monitor treatment response in the sick pen where temperatures are recorded daily and a change is the criteria being watched. Afternoon readings could seldom if ever be meaningful. At dawn we have observed the highest normal temperatures on the coldest days and the lowest on the hottest days of the year.

Nutrition

The diets used at Pawhuska in recent trials have been

based on free choice native grass hay plus one to two pounds of a 40 percent protein pellet. These feeding programs have evolved for two reasons peculiar to the Pawhuska Station. First, these diets have given a satisfactory health response. Secondly, this is the cheapest way to feed these cattle in terms of out of pocket costs at this location.

The work that Dr. Lofgreen has conducted at Clayton and when he was in California has shown that higher energy receiving rations gave more economical gains in this phase of the business. At the station gains on the hay and pellet diet have ranged from a little under a pound up to about two and a half pounds a day for the 28 day duration under our weighing conditions. Our weighing conditions are an off truck weight to an over night stand with out feed or water. Under these conditions most loads of cattle just recover there purchase weights in 28 days. This means these cattle come out of the reveiving phase costing more than their original purchase cost, but in good shape health wise. This program may not be right for many cattlemen. What is critical is the program which follows the receiving phase.

Recent research indicates that it may not be economical to add more energy to diets which are based on grass hay fed free choice. In one trial one hundered eighty head, one load of calves and one load of yearlings, were fed two pounds of pellets containing 40 percent protein or six pounds of a 13 percent protein-energy feed daily.

Daily gains averaged 1.47 lbs. per day for the cattle receiving the high protein feed and 1.55 lbs. per day for the animals fed the high energy feed. Free-choice hay intake averaged 9.0 lbs. per day for the protein cattle and 7.7 for the energy lot. Total feed fed was 10.5 lbs per day and 13.1 for the cattle fed protein and energy respectively, for the 28 or 29 day receiving period. Response of calves to supplemental energy was more favorable than response of yearlings.

Additional expense of feeding six pounds of high energy feed in addition to grass hay did not improve weight gains or animal health. These cattle will be weighed again after being pastured on wheat and again out of a feedlot. Pellet composition and detailed summary are given in tables 1 and 2.

Table 1: Composition of Experimental Supplements

Ingredients, %	Supplement Type Energy	Protein
Soybean meal	13.00	90.80
Corn	84.96	0.00
Dicalcium phosphate	1.00	2.75
Salt	1.00	3.00
Vitamin A-30000 I.U./G	0.036	0.11
Cottonseed hulls		1.75
Calcium carborate		1.50
Trace mineral		0.10
Protein, %	13.00	40.00

Table 2. Animal Performance, Protein vs. Energy

	Calves		Yearlings	
Feed	2# 40% CP	6# 13% CP	2# 40% CP	6# 13%CP
Days	29	29	28	28
Number of animals	49	46	42	43
Initial Weight lbs	456	455	448	460
Final weight lbs	489	494	503	512
Average daily gain	1.11	1.31	1.89	1.81
Average daily hay	8.52	7.27	9.54	8.24
Average daily conc	1.91	5.26	1.93	5.41
Total daily feed	10.43	12.53	11.47	13.65
Feed per lb. gain	9.40	9.56	6.07	7.24
Percent sick once	55.10	51.10	38.10	51.16
Percent sick twice	14.29	4.26	0.00	9.30
Percent dead	2.13	0.00	0.00	0.00

In a second trial ninety-nine yearling steers were fed either two declining to one pound of 40 percent protein pellets or two pounds of 40 percent protein changing to three pounds of 13 percent protein energy feed. Average daily gain averaged 1.24 lbs. per day for the high protein treatment and 1.18 lbs. per day for those changed to three pounds of energy feed. While supplemental protein intake of both groups of cattle was held constant the energy group received three vs. one pound of supplement per day, but did not gain as well. Intake of free choice hay averaged 8.50 pounds per day for the high protein cattle and 8.27 pounds per day for those which got the three pounds of energy feed. The extra feed fed in the energy treatment saved 0.23 pounds of hay per day and resulted in the total feed conversion of 8.08 for protein and 9.32 for energy.

Unless three pounds of high energy 13 percent protein feed cost less than one-third the cost of one pound of 40

percent protein feed it would not have been economical. The supplement pellets used were the same as those shown in table 1 and animal performace is shown in table 3.

The poor response to energy feed fed with long grass hay is not inconsistant with other work at OSU where the response to added energy to standing summer grasses was very similiar. There is very likely a sharp drop in the digestibility of the hay when ever starch (from grain) is added to the diet.

Table 3: Steer Performance, Three pounds Energy vs. One Pound of Protein Pellets.

Feed	2# 40%-->3# 13%	2# 40%-->1# 40%
Days	25	25
Number of animals	49	50
Initial weight lbs.	476	473
Final weight lbs.	505	504
Average daily gain lbs.	1.18	1.24
Average daily hay lbs.	8.27	8.50
Average daily concentrate	2.60	1.40
Total daily feed	10.87	9.90
Feed per lb. gain	9.21	7.98
Percent sick once	54.00	60.00
Percent sick twice	4.00	2.00
Percent dead	2.00	0.00

The response to medical treatment on the diets used at the Pawhusha station has been excellent. Our attempts at using high grain milled receiving diets (60 to 70 percent concentrate) were successful as are those of Dr. Lofgreen but feed costs over a dollar a day were too much for the local ranchers. Additional research to measure the subsequent effects of receiving nutrition on overall gain is needed. Many cattlemen buy cattle in the fall and overwinter these cattle at very low levels of gain, in this case a high gain in the receiving phase may be wasted. The evidence is mounting, for cattle, which move on to high quality green pastures that additional gain in the receiving phase will be maintained and possibly inhance the gain on grass.

Mass-medication vs. Individual Treatment

Three loads of cattle were received at the station and each load was split into one of three treatments. One third of the cattle served as negative controls, in that they were processed in a normal manor but if they became ill no treatment was administered. The second group was treated individualy as needed using the procedures outlined in OSU

RP-9104. The third group were administered a mass-medication consisting of LA 200 and a sustained release sulfamethizine bolus at time of processing.

The cattle in these tests were shipped in with origin usually Alabama. The response of the negative controls was especially interesting. Most of the time niether we or cattlemen can really gage the effectiveness of any health program for lack of a negative control. The data in Table 4 summarize the health response due to these treatments.

Table 4; Health Response of Three Loads Including Negative Controls.

Number of Animals	Reg.	Mass	Neg. Controls
On Trial	81	82	63
Percent Sick	49.38	39.02	60.31
Percent Dead	0	0	3.17
Percent Chronic	0	0	4.76
% Dead & Chronic	0	0	7.93

Over these three loads the cost of not treating sick cattle amounted to the cost of almost eight percent of the cattle. It is very imporntant to note that the negative controls were processed in our normal manner, they were properly immunized for the common bacterial and viral diseases. They were also wormed and treated for external paracites. The inference from this data may be that some field treatment programs may be of little value, some may actually increase losses.

A break-down comparing the program of mass-medication to the regular procedure is shown in Table 5.

Table 5; Mass Medications on Arrival

Number of Animals	Regular	*Mass Med*
On Trial	81	82
Percent Sick	49.4	39.0
Sick at Processing %	13.6	9.8
Sick After Processing %	35.8	29.3
Sick During 1st Week %	28.4	12.2
Sick After 1st Week %	7.4	17.1
Repulls % Total	20.0	31.3
---During First Week %	0	2.4
---After First Week %	9.8	9.8

* Mass Medications Consisted of Injectable LA-200 and SR Boluses

Work needs to continue on both the efficacy and economics of mass vs. conventional medication programs. The cost of the mass medication program applied to the 450 pound cattle used in these trials would range from at least $4.00 to $6.00 depending on the cost of two drugs to the cattleman. The use of the mass treatment reduced the total number of cattle sick from 49 percent to 39 percent. The important figure is the number of cattle that get sick after processing. The difference in table 5 is the 29.3 percent vs. the 35.8 percent for the conventional treatment. There was a shift in the number of cattle pulled after the first week, which for cattlemen who only closely observe there cattle for the first few days might present a potential loss. Seventeen percent of the cattle on the mass-medication showed up sick after the first week. This is about ten percent more than the conventional treatment.

Early in the project at Pawhuska all loads of cattle were divided into two groups. One of these groups was divided on to four traps (about four acres each) and the other group was divided into four drylot pens (about 400 sguare feet per head). After following this procedure for several loads it soon became apparent that most of the death loss and real problem cattle were comming from the traps. The problem was diagnosed as one of management. It was not possible to detect illness and start treatment as soon as it is where cattle are confined under close observation.

Dry lot pens have replaced the traps with much better results in recent years. We have learned that we cannot process cattle right off the truck. By resting the cattle over night before processing it has been possible to identify over 70 percent of the sick cattle at processing.

The key to any cattleman's succesfull receiving program is carefully planned management. Delays in working the cattle through the processing are can destroy the value of the thermometer in detecting sick cattle. Delays in the prompt treatment of sick cattle can only lead to higher losses. OSU fact sheet no.9103 is a helpful check list of things which need to be done before the cattle arrive, to insure a successful receiving program.