

Protein vs Energy in Receiving Diets for Stocker Cattle

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Story in Brief

One hundred eighty head, one load of calves and one load of yearlings, were fed 2 lb of pellets containing 40 percent protein or 6 lb of a 13 percent protein-energy feed daily.

Daily gains averaged 1.47 lb per day for the cattle receiving the high protein feed and 1.55 lb per day for the animals fed the high energy feed. Free-choice hay intake averaged 9.0 lb per day for the protein cattle and 7.7 for the energy cattle. Total feed fed was 10.5 and 13.1 lb per day 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 6 lb 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. Those results will be reported in the future.

Introduction

One receiving program for stressed, shipped cattle has evolved at the Pawhuska Research Station. The diet has consisted of a high quality, locally produced native grass hay fed free choice supplemented with 2 lb of a 40 percent protein pellet fed once daily. This program has resulted in an excellent recovery of health and is considered economical by local ranchers, who pay for the feed. They produce the hay, and their only added expense is for protein pellets. In the past all loads of cattle have received 2 lb of pellets for at least the first week, after which the rate has been reduced to 1 lb per day if the cattle appear strong.

Results of Lofgreen at Clayton, New Mexico, suggest that much more rapid gains can be achieved with a 72 percent concentrate program. His data shows consistently higher rates of gain with a higher concentrate receiving program, and this advantage is maintained in subsequent grazing or feeding periods. However, rations fed at Clayton are usually complete milled rations rather than concentrate pellets added to loose-fed long grass hay as used in the Osage.

The objective of this research was to determine if there is an economic response to providing additional energy in receiving diets based on long grass hay fed free-choice.

Experimental Procedure

Two truckloads of steers were purchased on successive days on the Oklahoma City market and delivered to the OSU research facility at Pawhuska, Oklahoma. On arrival the cattle were handled as outlined in OSU Fact Sheets 9102 and 9103 and OSU RP-9104. Cattle were processed on 2 successive days, and each load was divided into four pens. The loads were kept in separate pens except when sick

cattle went to one of two sick pens. One sick pen was maintained for each nutritional treatment. Two pens of cattle from each load were assigned to diets consisting of free choice grass hay plus either 2 lb of 40 percent protein pellets or 6 lb of 13 percent protein high energy pellets (Table 1).

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 carbonate		1.50
Trace mineral		0.10
Protein, %	13.	40.

Hay was kept in feeders at all times, and concentrate pellets were fed twice daily in feed bunks. All animals in a pen had an equal opportunity to eat pellets. It took several days before the animals receiving the high energy pellet would consume 6 lb each day. Initial weights were determined as cattle were unloaded from trucks. Final weights were taken after 12 hours without feed or water. These cattle will continue on test on wheat pasture and will be followed through the feedlot.

Results and Discussion

There appeared to be a difference in the age of the cattle in the two loads received. One load was designated as calves and the other as yearlings. Performance differed with age (Table 2).

Response to additional grain feeding was very poor. Concentrate intake with the high energy supplement was 40 percent of total intake. As in other trials (Gill, et al., 1982; Lusby, et al., 1982) grain had an unfavorable negative associative effect on forage intake and/or digestibility.

Table 2. Animal performance

Feed	Calves		Yearlings	
	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, lb	456	455	448	460
Final weight, lb	489	494	503	512
Average daily gain, lb	1.11	1.31	1.89	1.81
Average daily hay, lb	8.52	7.27	9.54	8.24
Average daily conc., lb	1.91	5.26	1.93	5.41
Total daily feed, lb	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

Probably starch in the energy feed reduced the digestibility of the hay to an extent that intake of digestible energy was not increased, and value of added energy was not realized. Some of the advantage of feeding more grain also may have been lost due to greater fill of forage-fed steers.

Typical of many stressed cattle, about half the cattle on both treatments were sick but responded well to treatments outlined in OSU RP-9104. It is possible that calves and yearlings differ in their health response to protein or energy supplementation. With the yearlings there was less sickness with the high protein diet, consistent with other observations. The response of these cattle in subsequent periods of grazing on wheat pasture and finishing in a feedlot is being followed.

Literature Cited

- Gill, D. et al. 1982. OSU MP-112
Lusby, K. et al. 1982. OSU MP-112
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The Effect of Low Level Energy vs Protein on Just-Received Stocker Steers

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Story in Brief

Ninety-nine yearling steers were fed 2 lb of a 40 percent supplement for 10 days, then either 1 lb of a 40 percent protein pellet or 3 lb of 13 percent protein energy feed. Average daily gain averaged 1.24 lb per day for the high protein treatment and 1.18 lb per day for those changed to 3 lb of energy feed. While supplemental protein intake of both groups of cattle was held constant, the energy group received 3 vs 1 lb of supplement per day but did not gain as well. Intake of free-choice hay averaged 8.50 lb per day for the high protein cattle and 8.27 lb per day for those which got the 3 lb of energy feed. The extra feed fed in the energy treatment saved 0.23 lb of hay per day and resulted in the total feed conversion of 8.08 for protein and 9.32 for energy.

If 3 lb of high energy, 13 percent protein feed had cost more than one-third the cost of 1 lb of 40 percent protein feed, however, it would not have been economical.

Introduction

A constant program for evaluating rations for just-received cattle is a part of the nutrition and health program at the Pawhuska Research Station. There is