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## Protein levels for bulls on 140-day, gain test

### **Abstract**

Three trials with Angus, Hereford, and Shorthorn bulls produced in the University teaching herd were conducted to determine effects of 10, 12, or 14% calculated crude protein levels in grain rations. In trial 1, the 10% crude protein grain rations resulted in significantly ( $P < .01$ ) lower gains than did either 12 or 14% crude protein grain rations. The 10% ration was not tested in trials 2 and 3. Rates of gain and feed per pound of gain did not differ significantly between bulls fed 12% or 14% protein rations.

### **Keywords**

Cattlemen's Day, 1974; Report of progress (Kansas State University. Agricultural Experiment Station); 210; Beef; Protein; Gain

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Protein Levels for Bulls on 140-Day, Gain Test

Miles McKee, R. R. Schalles and K. O. Zoellner

### Summary

Three trials with Angus, Hereford, and Shorthorn bulls produced in the University teaching herd were conducted to determine effects of 10, 12, or 14% calculated crude protein levels in grain rations.

In trial 1, the 10% crude protein grain rations resulted in significantly ( $P < .01$ ) lower gains than did either 12 or 14% crude protein grain rations. The 10% ration was not tested in trials 2 and 3.

Rates of gain and feed per pound of gain did not differ significantly between bulls fed 12% or 14% protein rations.

### Introduction

With increased need for rate of gain information on bulls, many questions concerning protein levels have been raised. Three levels of protein were tested in these trials.

### Experimental Procedure

We used bulls produced in the University teaching herd in the spring of 1970 and 1971 and the fall of 1970. The two spring born crops were started on test in November the year they were born; fall born calves were started the following May. All trials were for 140 days.

In 1970, trial 1, 12 Angus, 9 Hereford, and 3 Shorthorn bulls averaging 233 days old and 497 pounds were randomly assigned by breed to a 10%, 12%, or 14% calculated crude protein (table 15.1). Chemical analyses were 11.32%, 13.2%, and 14.6% protein. Bulls were individually stalled in a barn with a self-feeder and automatic waterer in each stall. Prairie hay was fed for 30-minute consumption twice daily. All bulls were placed in an exercise lot approximately 6 hours each day. Bulls averaged 851 pounds off test.

Trials 2 and 3, fall 1970 and spring 1971 calves, were conducted using 12 and 14% rations. Three Angus, 2 Herefords, and 6 Shorthorns (trial 2) were placed on test at 214 days average and 395 pounds average weight. Bulls were randomly assigned by breed and feed as in trial 1. Average off test weight in September was 785 pounds. The 1971 trial involved 4 Angus, 10 Hereford, and 2 Shorthorn bulls placed on feed at an average age of 220 days and 471 pounds. Bulls were randomly assigned to the two test rations by breed and group-fed with grain available in self-feeders. Prairie hay was fed ad libitum. Average weight off test was 872 pounds.

Because the bulls were part of the teaching herd, it was necessary to use them for classwork and extra-curricular activities during the test.

### Results and Discussion

Bulls fed the 10% protein ration in trial 1 gained significantly ( $P < .01$ ) less, ADG 2.09, than bulls fed 12% (ADG 2.59) or bulls fed 14% protein rations (ADG 2.68). Semen collected by electroejaculation at the end of trial 1 was evaluated for volume and quality. There was no difference among bulls on different rations.

Although bulls fed the 14% ration gained slightly more than bulls fed the 12% ration (2.85 to 2.75 ADG), trials 1, 2, and 3, the difference was not statistically significant. Bulls were weighed at approximately 28 day intervals during the trials (table 15.2). Rations tested did not affect rate of gain.

Trials to study the effect of energy composition of rations are currently in progress.

Table 15.1. Rations for Gain Testing Bulls

Ingredient, lbs.	10% Protein (Ration A)	12% Protein (Ration B)	14% Protein (Ration C)
Rolled oats	1600	1455	1334
Flaked milo	390	353	324
Soybean oil meal	---	91	166
Alfalfa crumbles	---	91	166
Pre-mix <sup>a</sup>	10	10	10
Salt	10	10	10

<sup>a</sup>Pre-mix in lbs. = Rolled milo, 38.5; trace mineral, 5.0; Aurolfac 10, 3.0; Vitamin A, 3.3.

Table 15.2. Average Daily Gain (pounds) by Bulls from Start of Trial to Indicated Weigh Periods

	<u>Trial 1, 24 bulls</u>				
Cumulative days on test	31	56	84	112	140
Daily gain on:					
10% ration, A	0.88	1.83	2.22	1.77	2.03
12% ration, B	1.45	2.40	2.76	2.34	2.54
14% ration, C	1.54	2.70	2.95	2.42	2.61
	<u>Trial 2, 11 bulls</u>				
Cumulative days on test	28	56	84	112	140
Daily gain on:					
12% ration, B	3.43	2.98	3.09	3.12	2.89
14% ration, C	3.48	2.65	3.06	3.04	2.95
	<u>Trial 3, 16 bulls</u>				
Cumulative days on test	29	55	84	112	140
Daily gain on:					
12% ration, B	3.90	3.64	3.35	2.89	2.81
14% ration, C	3.81	3.57	3.37	3.09	2.99