

Kansas Agricultural Experiment Station Research Reports

Volume 0
Issue 12 *Keeping up with Research*

Article 12

1974

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Recommended Citation

Chyba, Leslie J. and Boren, Fred W. (1974) "Continuous and Interrupted Supplemental Protein Feeding Compared," *Kansas Agricultural Experiment Station Research Reports*: Vol. 0: Iss. 12. <https://doi.org/10.4148/2378-5977.7249>

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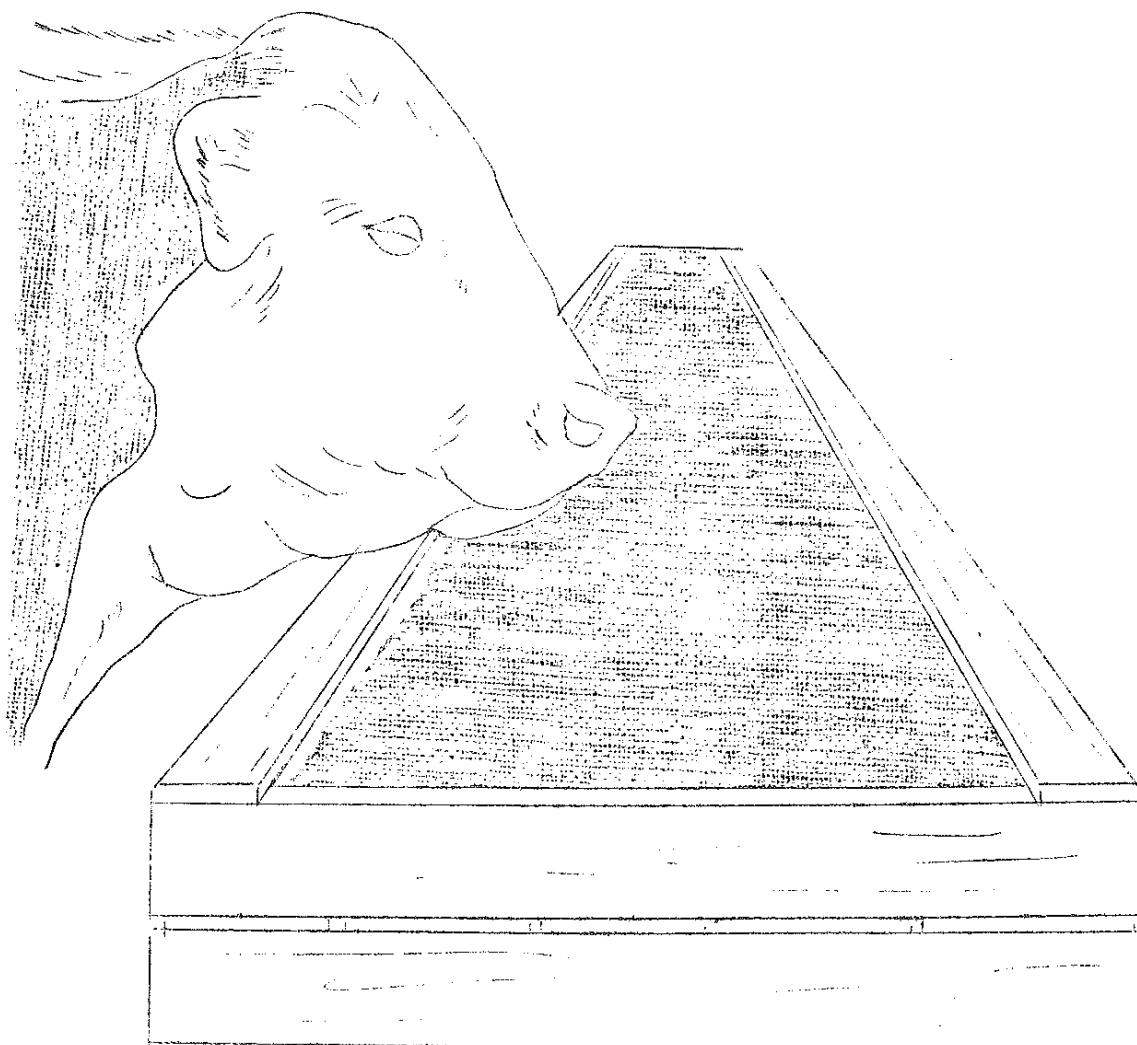


KEEPING UP WITH RESEARCH 13

Contribution No. 43

November 1974

CONTINUOUS AND INTERRUPTED SUPPLEMENTAL PROTEIN FEEDING COMPARED



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Continuous and Interrupted Supplemental Protein Feeding Compared

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In view of the high cost of natural protein meals (soybean oil meal), the protein needs of finishing cattle should be defined more clearly. Toward that end, research on an animal's protein requirements at different stages of growth and development has been initiated at Kansas State University. In recent feedlot studies¹ removing supplemental protein from a typical finishing ration 28 days before animals are slaughtered did not adversely affect their performance.

We removed supplemental protein at two periods during the finishing phase. Fifty-four Angus heifers were equally allotted by weight to nine lots. Three lots were randomly assigned to each of the treatments:

- 1) supplemental protein withdrawn from ration after 90 days on feed,
- 2) supplemental protein withdrawn from ration after 118 days on feed,
- 3) supplemental protein fed throughout the feeding period (152 days).

When supplemental protein and Starea² were withdrawn, they were replaced with rolled milo. Vitamins, minerals, and antibiotics were continued. The ration consisted of 74% rolled milo, 18% brome hay, and 8% soybean meal-based supplement (Table 1). The average daily ration contained approximately 12.4% crude protein until protein was withdrawn. Then crude protein content of the ration (treatments 1 and 2, Table 1) was reduced to 9.6%.

The heifers averaged 850 and 900 pounds, respectively, when supplemental protein was withdrawn from the 90 and 118-day treatments. That reduced supplement costs by 20% and 11%, respectively. But removing relatively expensive protein did not reduce costs as much as expected, because high-priced milo was substituted.

Removing supplementary protein at either 90 or 118 days did not affect animal gains or feed efficiency significantly ($P < .05$). However, gains, ration intake, and feed efficiency were better for animals on continuous and 118-day treatments than for those on the 90-day treatment.

At the end of the 152-day study all animals were slaughtered and carcass data were taken. The following differences in carcasses were noted (Table 2): the 152-day heifers carried more fat than did the 90-day heifers and had higher conformation scores than either of the two treatments whose supplement was withdrawn.

The data indicate that supplemental protein can be withdrawn from the finishing ration of heifers weighing 850 to 900 pounds without adversely influencing their performance.

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1. Riley, J. G., K. F. Harrison, and D. L. Good. 1974 Beef Cattle Commercial Feedlot Studies. Trial 2 - Effects on Steer Performance of Variable Protein Levels, Implanting, and Worming. Kansas State University, Report of Progress 210.
 2. U.S. Patent No. 3642486. Starea is the trademark of the Kansas State University Research Foundation, Manhattan, Kansas, 66506.

Table 1. Composition of soybean meal-based supplement used in heifer rations.

Ingredient	Lbs/ton
Soybean meal ^a	1,000
Starea ^a	550
Milo	220
Dicalcium phosphate	150
Limestone	40
Aureomycin ^b	35
Trace mineral	5
Vitamin A ^c	1.5

- a. Removed from supplement after 90 and 118 days of feeding for treatments 1 and 2, respectively, and replaced with rolled milo.
b. Provided 70 mg of antibiotic per head per day.
c. Provided 20,000 IU of Vitamin A per head per day.'

Information in this report is for farmers, producers, colleagues, industry cooperators, and other interested persons. It is not a recommendation or endorsement because it is not yet backed by enough research.

Contribution no. 43, Southeast Kansas Branch Experiment Station, Mound Valley, Kansas Agricultural Experiment Station, Kansas State University.

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Table 2. Influence of withdrawing supplemental protein on animal performance and carcass characteristics (heifers).

	Continuous supplemental protein 152 days	Supplemental protein withdrawn at	
		90 days	118 days
No. of animals	18	18	18
Initial wt., lbs.	582.9	597.6	592.6
Final wt., lbs.	950.9	931.4	939.2
Wt. gain, lbs.	368.0	333.8	346.6
<u>Avg. daily gains, lbs.</u>			
0-28 days	4.13	4.33	4.38
29-60 days	2.77	2.06	1.82
61-90 days	2.55	2.19	2.71
91-118 days	1.38	1.31	1.68
119-152 days	1.91	1.31	1.10
0-152 days	2.42	2.20	2.28
Supplement, lbs.	2.0	2.0	2.0
Grain, lbs.	17.8	16.9	17.6
Hay, lbs.	4.2	4.2	4.2
Total, lbs.	24.0	23.1	23.8
Feed efficiency - feed/lb. gain, lbs.	9.91	10.50	10.44
<u>Carcass data</u>			
Hot wt., lbs.	571.8	552.3	566.7
Dressing %	60.1	59.3	60.3
Fat thickness 12th rib, in.	.48 ^a	.37 ^b	.44 ^{ab}
Degree marbling ¹	17.3	15.1	16.6
Conformation score ²	21.2 ^c	20.4 ^d	20.4 ^d
% Kidney knob	2.86	2.81	2.75
Loin eye, sq. in.	11.57	12.06	11.87
USDA grade	20.5	19.7	19.9

a,b,c,d. Values on same line bearing different superscripts differ significantly ($P < .05$).

1. 15 = modest (-); 16 = modest (+); 17 = moderate (-).

2. 19 = low choice; 20 = average choice; 21 = high choice.