

### Summary

The results from the first in a series of fattening trials to determine the effect of different rates of gain on efficiency of feed conversion and carcass composition are reported. Sixteen steer calves were individually fed to make 365 lb. total feedlot gain. One group of 4 calves was fed so as to gain at each of the following rates: High throughout; high for one-half total feedlot gain and then moderately; moderately and then high, and moderately throughout. The high level of gain was achieved by feeding 2 lb. milo per cwt., while calves fed to gain at a moderate rate received 1 lb. per cwt.

Results of the first trial indicate that steer calves fed to gain rapidly for 365 lb. produced a higher grading carcass, with more marbling and a higher percentage of fat. Such treatment, however, resulted in less efficient conversion of digestible nutrients to gain, less round, smaller rib eye area and less lean tissue in the carcass. Gains and carcass desirability of the moderately-fed group proved very encouraging for this type of feeding regime. Changing from high to moderate, or the reverse, after one-half of the feedlot gain had been achieved, generally gave results intermediate to feeding for either high or moderate gains throughout. It appears that the high-moderate treatment may be the least desirable of the four methods studied.

## Mixed Rations vs. the Free-Choice Feeding of Milo and Supplement for Growing and Finishing Pigs

J. C. HILLIER AND J. J. MARTIN

Does the feeding of a complete ration containing ground milo plus the protein, vitamin, mineral and antibiotic supplements to be fed, all mixed together, produce faster and/or more economical gains than would be obtained from a free-choice system of feeding? In the free-choice system, the ground milo is fed in one part of the feeder and the supplement containing the necessary protein, mineral, vitamin and antibiotic materials in another part of the feeder, with the pigs free to choose how much of each they eat.

The relative performance on these two systems is important to the feeder for the free-choice system requires the mixing of only about 25 percent as much feed as is required if a complete mixed ration is used. Information on this point is also important to the feeders in deciding whether to buy a complete mixed ration or a supplement and grain that could be fed free-choice.

The pigs used in these two trials were started on feed shortly after they were weaned, averaging nine to ten weeks of age. They were of Hampshire, Poland China and Yorkshire breeding with an equal number of each breed in each lot within trials. All of the pigs used were gilts.

The pigs were fed in concrete-floored pens of which approximately

one-third of the area was covered by a shed open to the south. A fine mist was sprayed over a section of the pen during the day in the summer. The pigs were free to move about under the mist or in other sections of the pen as they desired. In winter a section of the covered area was bedded.

Weights were taken every fourteen days until the pigs approached 200 pounds in weight. At that time the weights were taken as seemed desirable and the pigs were removed from the test as near the desired weight as possible.

Two mixed rations and four free-choice rations were compared. Previous tests indicated that lysine is the first limiting amino acid in a milo soy meal type of ration. To improve the lysine level of the ration, 3 percent fish meal was used to replace a part of the soy meal in one mixed ration and a comparable amount in two supplements. Vitamin A acetate was used to replace alfalfa leaf meal as a source of this vitamin in two of the supplements. It was felt that the removal of alfalfa meal from the supplement would lower the fiber content and improve the energy level of the ration. Since pigs receiving the vitamin A acetate in place of alfalfa meal in Trial 1 consumed more supplement than seemed necessary 20 percent ground milo was used in the supplement for Lots 5 and 6 during the second trial in an attempt to reduce the protein intake on this supplement.

A comparison of the results obtained on the two mixed rations (1 and 2) with those produced by the two free-choice rations containing comparable ingredients, (3 and 4), shows that the two types of rations produced about the same rate of gain in trial 1 (summer, 1957). About 3 percent less feed was required per unit of gain when the mixed ration was fed than when free-choice feeding was practiced.

A comparison of the rate and economy of gain made by Lots 3 and 4 with those made by 5 and 6 (alfalfa meal vs. vitamin A concentrate) shows that the two types of supplements produced about equal gain. However, about 7 percent less feed was required by the group receiving the vitamin A concentrate in place of the alfalfa leaf meal.

The supplements containing the fish meal (Lots 4 and 6) produced about the same rate and economy of gain as those in which soy meal alone (Lots 3 and 5) was the source of supplemental protein. Considering all lots, those rations containing soy meal alone as the supplemental protein (1, 3 and 5) produced almost the same rate and economy of gain as those in which fish meal provided a part of the supplemental protein. However, since fish meal is a more expensive source of protein, pigs fed rations containing this feed had a feed cost per unit of gain that was 36 cents per hundred above that for those receiving only soy meal (\$8.48 vs. \$8.84).

In Trial 2 the rate and economy of gain was almost the same for the comparable lots receiving a mixed ration and those receiving ground milo and supplement free-choice (1 and 2 vs. 3 and 4). Rations 5 and 6

Table 1.—Mixed rations vs. free-choice feeding of milo and supplement—Rations Used—Trial 1—Summer 1957

Lot No.	1	2	3	4	5	6
Method of Feeding	Mixed Ration	Mixed Ration	Free-Choice	Free-Choice	Free-Choice	Free-Choice
	Ration	Ration	Supplement	Supplement	Supplement	Supplement
Ration (%)						
Milo (ground) <sup>1</sup>	76.3 <sup>2</sup>	79.3	--	--	--	--
Soy meal	15.8	10.1	68.9	57.6	88.9	77.6
Fish meal	--	3.0	--	12.0	--	12.0
Dehyd. alfalfa meal	5.0	5.0	20.0	20.0	--	--
Bone meal	2.0	1.7	7.5	6.8	7.5	6.8
Salt	0.5	0.5	2.0	2.0	2.0	2.0
Antibiotic and B vitamin mix <sup>3</sup>	0.4	0.4	1.6	1.6	1.6	1.6
Vitamin A <sup>4</sup>	--	--	--	--	+	+
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percent protein						
Ration or Supplement	16.8	16.5	35.3	37.5	40.9	43.2
As consumed	15.3	15.3	15.3	15.3	16.9	17.0
Ratio of grain to supplement	--	--	5.0	5.6	4.3	4.6
Cost of ration or supplement						
Dollars/cwt. <sup>5</sup>	2.41	2.53	3.67	4.34	4.12	4.79

<sup>1</sup> Kafir 4414, a white colored variety was fed to all lots.

<sup>2</sup> The ration listed was fed until the pigs reached an average weight of 100 pounds. From 100 to 200 pounds a ration containing 14.0% crude protein was fed—same ingredients as above.

<sup>3</sup> The antibiotic-B vitamin mix supplies 5.4 mg. of antibiotics; 5.4 mcg. of B<sub>12</sub>, 2.0 mg. of riboflavin, 4.0 mg. of pantothenic acid, 9.00 mg. of niacin and 90 mg. of choline per pound of ration in lots 1 and 2 and was calculated to supply about the same amount to the other lots through the supplement. Zinc sulphate was also added at the rate of 0.02% of the complete rations.

<sup>4</sup> The vitamin A concentrate was added at a rate to supply 4,000 I U per pound of ration as consumed.

<sup>5</sup> The costs listed for rations 1 and 2 are for the ration used until the pigs reach 100 pounds. The rations fed from 100 to 200 pounds cost \$2.34 and \$2.45 per hundred, respectively, for rations 1 and 2. Milo was figured at \$2.00 per cwt.

Table 2.—Mixed rations vs. the free-choice feeding of milo and supplement—Summary of results—Summer 1957  
Average of duplicate lots

Lot No. Method of Feeding	1 Mixed Ration	2 Mixed Ration	3 Free- Choice	4 Free- Choice	5 Free- Choice	6 Free- Choice
No. of pigs	16	15	13	13	14	16
Av. initial wt. (lbs.)	56.9	58.0	57.8	56.9	58.1	57.1
Av. final wt. (lbs.)	200.1	195.9	195.4	195.6	191.7	196.9
Av. daily gain (lbs.)	1.58	1.49	1.51	1.53	1.50	1.53
Feed/lb. gain						
Complete ration	3.57	3.65	--	--	--	--
Milo	--	--	3.14	3.17	2.84	2.83
Supplement	--	--	.62	.58	.67	.62
Total feed/lb. gain	3.57	3.65	3.76	3.75	3.51	3.45
Feed cost/lb. gain (\$)	8.45	9.01	8.56	8.85	8.44	8.66

Table 3.—Mixed rations vs. free-choice feeding of milo and supplement—Rations used—Trial II—Winter 1957-58

Lot No.	1	2	3	4	5	6
Method of Feeding	Mixed Ration	Mixed Ration	Free-Choice	Free-Choice	Free-Choice	Free-Choice
	Ration	Ration	Supplement	Supplement	Supplement	Supplement
Ration (%)						
Milo (ground) <sup>1</sup>	76.3 <sup>2</sup>	79.6	--	--	20.0	20.0
Soy meal	15.8	10.1	68.9	57.6	68.9	57.0
Fish meal	--	3.0	--	12.0	--	12.0
Dehyd. alfalfa leaf meal	5.0	5.0	20.0	20.0	--	--
Dicalcium Phos.	1.5	1.5	5.5	5.1	5.5	5.4
Calcium Carbonate	0.5	0.5	2.0	1.7	2.0	2.0
Salt	0.5	0.5	2.0	2.0	2.0	2.0
Antibiotic and B vitamin mix <sup>3</sup>	0.4	0.4	1.6	1.6	1.6	1.6
Vitamin A	--	--	--	--	+	+
Total	100.0	100.0	100.0	100.0	100.0	100.0
Percent Protein						
Ration or Supplement	16.7	16.4	35.2	37.5	34.0	36.2
As consumed	15.5	15.6	15.3	15.6	16.7	17.9
Ratio of grain to supplement	--	--	5.0	5.7	3.4	2.8
Cost of ration or supplement (\$)	2.38	2.5	3.59	4.28	3.78	4.47

<sup>1</sup> Kafir 4414, a white colored variety was fed to all lots.

<sup>2</sup> The ration listed was fed until the pigs reached an average weight of 100 pounds. From 100 to 200 pounds, a ration containing 14% crude protein was fed.

<sup>3</sup> The antibiotic-B vitamin mix supplies 5.4 mg. of antibiotics; 5.4 mcg. of B<sub>12</sub>, 2.0 mg. of riboflavin, 4.0 mg. of pantothenic acid, 9.00 mg. of niacin and 90 mg. of choline per pound of ration in Lots 1 and 2 and was calculated to supply about the same amount to the other lots through the supplement. Zinc sulfate was also added at the rate of 0.02% of the complete rations.

<sup>4</sup> The vitamin A concentrate was added at a rate to supply 4,000 I U per pound of ration as consumed.

<sup>5</sup> The costs listed for rations 1 and 2 are for the ration used up to a weight of 100 pounds. The rations fed from 100 to 200 pounds cost \$2.32 and \$2.45 for rations 1 and 2, respectively.

Table 4.—Mixed rations vs. the free-choice feeding of milo and supplement—Summary of results—Winter 1957-58  
Average of duplicate lots

Lot No. Method of Feeding	1 Mixed Ration	2 Mixed Ration	3 Free- Choice	4 Free- Choice	5 Free- Choice	6 Free- Choice
No. of pigs	15	15	13	14	14	15
Av. initial wt. (lbs.)	65.4	65.8	66.3	65.0	65.1	65.5
Av. final wt. (lbs.)	199.3	196.8	197.1	198.4	196.5	201.4
Av. daily gain (lbs.)	1.59	1.57	1.56	1.48	1.55	1.77
Feed/lb. gain (lbs.)						
Complete ration	4.29	4.44	--	--	--	--
Milo	--	--	3.72	3.65	3.07	2.97
Supplement	--	--	.77	.71	.86	1.08
Total feed/lb. gain (lbs.)	4.29	4.44	4.49	4.36	3.93	4.05
Feed cost/lb. gain (\$)	10.03	10.98	10.17	10.37	9.40	10.77

(vitamin A) produced about .14 pound more grain per day on about 10 percent less feed per unit of gain than Rations 3 and 4 (alfalfa meal). Again in this trial, rations containing fish meal produced only slightly faster gains than those not containing this ingredient.

In general, the results of these trials indicate that:

The advantage of feeding a mixed ration over the free-choice feeding of milo and supplement is small from the standpoint of both rate and economy of gain.

The supplement must be compounded specifically to meet the deficiencies of the grain with which it is to be fed. The relative palatability of the grain and supplement is an important factor to consider.

The addition of fish meal to a milo-soy meal type of basal ration did not improve the rate or economy of gain to any appreciable extent and proved to be uneconomical.

Replacing alfalfa meal in the supplement with vitamin A acetate, as a source of this vitamin, improved the gain slightly and reduced the feed required per unit of gain by 7 to 10 percent.

## Levels of Supplemental Winter Feeding of Beef Cows and Creep-Feeding Fall Calves

A. B. NELSON, R. F. HENDRICKSON, N. W. ROBINSON,  
W. D. CAMPBELL and G. R. WALLER

In recent years there has been an increase in number of cows calving in the fall in our area. This change in calving season has resulted in a need for additional data on feeding and managing such cattle grazing native grass (Bluestem and associated grasses) yearlong. The cow's requirements for nutrients are markedly increased while she is suckling a calf and supplemental winter feed represents a large portion of the total cost of producing a calf. The amount and kind of supplemental feed needed is determined by the amount and quality of forage available in a pasture. In parts of our state the native grasses furnish practically all of the roughage consumed by a cow herd.

Questions to be considered in planning a winter feeding program include: What is the effect of level of winter feeding on weaning weights of calves and rebreeding rate of the cows? Should creep-feeding be recommended for fall-dropped calves which are to be marketed as feeders in mid-summer? Basically our problem concerning level of wintering is the fact that we do not know what percent of her body weight a cow can lose during the winter and still produce a heavy calf at weaning and rebreed so that another calf is produced the next year.

In order to provide information on the above and other questions, an experiment having the following objectives, was initiated in the fall of 1954.

1. To compare two levels of supplemental winter feeding of beef cows suckling calves.