Growing and Finishing Hogs With Free-Choice vs. Complete Rations; Pelleted vs. Meal Ration; Ground vs. Whole Milo

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With much attention being given to improved efficiency and mechanized systems of swine production, the matter of ration preparation becomes an important one. Considerations as to how the feeding is to be handled are basic in the planning of any hog operation. If free-choice feeding is practiced it is necessary to mix only 25 percent or less of the total feed consumed. If complete mixed rations in pellet form give better performance, so far as rate and efficiency of gain are concerned, there remains the question of how these operations can be performed at the least cost.

Work at other stations has shown a distinct advantage for mixing and pelleting oats and barley rations. Little advantage has been shown for pelleting corn rations, also, it has been shown by this and other stations that young pigs, those below 75 pounds, do best on mixed and pelleted rations. However, some questions on the performance of growing and finishing pigs on complete and free choice rations remain unanswered, particularly in rations where milo is used as the only grain.

Procedure

This series of tests was designed to determine the performance of pigs fed the same ingredients, but offered in various forms.

The treatments were as follows. Lots 1 and 2 were fed a complete mixed ration. This ration was fed in meal form to Lot 1 and in the form of a 3/8-inch pellet to Lot 2. Lots 3 through 8 were self-fed free-choice. Lot 3 received ground milo and the supplement in meal form, while Lot 4 was given ground milo plus the supplement in pellet form. The grain was ground and pelleted for Lots 5 and 6. The supplement was fed in meal form to Lot 5 and in pellet form to Lot 6. Whole grain was used for Lots 7 and 8. The supplement for Lot 7 was in meal form, whereas, Lot 8 received its supplement in the form of pellets.

Percentagewise, the complete ration fed at the start of the trial was composed of milo (actually kafir 44-14), 82.5; soybean meal, 14.4; di-calcium phosphate, 1.5; calcium carbonate, 0.6; trace mineral salt, 0.5; and vitamin-antibiotic pre-mix, 0.5 percent. This ration was calculated to contain 16.0 percent crude protein. It was fed from the start of the experiment until the pigs reached an average weight per lot of about 110 pounds. From this time on the protein content of the ration was reduced to 14 percent for the remainder of the trial.

The supplement for all lots being fed free-choice consisted of ground milo, 8.0; soybean meal, 77.0; dicalcium phosphate, 8.0; calcium carbonate, 2.5; trace mineral salt, 2.5; and vitamin-antibiotic pre-mix, 2.5 percent.

Duplicate groups consisting of eight pigs each were fed on each ration treatment. The pigs were nine to ten weeks old at the start of the trial. Each gilt was removed from the trial as she reached approximately two hundred pounds. Only gilts were used in this test.

The pigs were kept in concrete floored pens about one-half of which was under roof. Each pen was equipped with a fogging nozzle which was turned on during the day in hot weather. Automatic water fountains supplied adequate water at all times. A six-hole self-feeder was used for each lot of eight pigs. Where free-choice feeding was practiced, four holes were devoted to grain feeding and two to supplement feeding. All feeders were checked closely to minimize feed wastage as well as to make sure sufficient feed was available to the pigs at all times.

Results and Discussion

The results are summarized in Table 1. Several comparisons can be made between the self-feeding of a complete mixed ration and the self-feeding free-choice of the same ingredients, by considering Lots 1 through 4. If one compares the average results for the two lots fed the complete ration (1 and 2) with comparable figures from the two free-choice fed lots (3 and 4), the following figures are obtained: daily gain 1.48 vs. 1.43; feed efficiency 3.11 vs. 3.37; feed cost $8.10 vs. $8.48.

In other words, the complete mixed ration produced slightly faster gains on 8.4 percent less feed per pound of gain. Also, the feed cost was $.38 less per hundred pounds gain where the complete ration was used.

Further comparisons can be made among Lots 1, 2, 3, and 4. A comparison between the feeding of a mixed ration in meal form (Lot 1) and the free-choice feeding of the same materials in meal form (Lots 3) is of interest. In this case, the mixed ration (Lot 1) produced pork for $0.91 per cwt less than the free-choice ration (Lot 3). In checking these figures, one might question the relatively high feed requirement in Lot 3, as compared to other lots where ground milo was self-fed free-choice. While the figure (3.56) appears to be out of line, a check reveals good agreement between the duplicate lots on this ration.

In terms of the feed cost per hundred pounds of gain, the treatments would rank in the order of: (1) complete ration, meal form (Lot 2); (2), free-choice feeding of ground milo and pelleted supplement, (Lot 4); (3), complete ration pelleted, (Lot 2); and (4). the free-choice feeding of ground milo and supplement in meal form. In every case groups of pigs fed free-choice rations consumed a higher percentage of protein in their ration than those on the mixed ration.

TABLE 1. Summary of results when using free choice vs. complete ration; pelleted vs. meal rations; ground vs. whole milo for growing and finishing pigs.

Lots	1	2	3	4	5	6	7	8
Ration form Complete ration	Meal	Pellet						
Free choice Grain Supplement			Meal Meal	Meal Pellet	Pellet Meal	Pellet Pellet	Whole Meal	Whole Pellet
Initial wt. (lbs.)	57.7	57.7	57.5	57.7	57.2	57.7	57.5	57.4
Final wt. (lbs.)	200.1	197.9	196.7	197.2	200.1	198.5	196.8	202.4
Av. daily gain	1.45	1.51	1.42	1.45	1.36	1.39	1.30	1.43
Feed/lb. gain in ration	3.06	3.15	3.56	3.18	3.37	3.37	3.90	3.71
% protein inration as consumed	14.6	14.6	15.7	17.5	16.1	15.5	15.6	16.5
Feed cost per 100# gain ($)	7.75	8.45	8.66	8.30	8.98	8.95	9.13	9.07

Feed cost—per cwt.	
Complete ration meal ($)	2.53
Complete ration pelleted	2.68
Supplement meal	4.00
Supplement pelleted	4.15
Whole milo	2.00

Charges per 100 pounds ($)	
Grinding	.10
Mixing	.10
Pelleting	.15

Pelleting the complete mixed ration (Lot 2 vs. Lot 1) did not improve feed efficiency but instead increased the cost of producing pork by $0.80 per cwt. Pelleting the supplement as compared to feeding it in meal form (Lots 4, 6 and 7 vs. Lots 3, 5 and 8) caused the consumption of a slightly higher percentage of supplement (16.3 vs. 15.8 percent crude protein). The average feed cost for groups of pigs fed the pelleted supplement was $8.77, whereas, it was $8.92 or $0.15 more per cwt where the supplement was fed in meal form.

Pelleting the ground milo had the effect of reducing the rate of gain and increasing the feed cost per unit of gain slightly. The increased cost was not due to lowered efficiency but rather to the cost of pelleting. In this connection it should be mentioned that the milo was ground as needed for all of the free-choice fed lots and for Lot 1 where the mixed ration was fed in the meal form. On the other hand, for Lots 2, 5 and 6, the milo was ground and the pelleting done at the start of the trial on a large enough quantity to last throughout the test.

Detereation in palatability or nutrient content, if any occurred, was not checked. The total duration of the trial was about one-hundred days.

A comparison of ground vs. whole milo can be made by considering Lots 3 and 4 vs. Lots 7 and 8. The grain was ground moderately fine in a burr mill. Pigs on ground milo gained slightly faster, required

about 12 percent less feed per unit of gain, and had a lower feed cost by $0.62, per cwt than those fed whole milo.

Summary

In these trials, complete mixed rations produced slightly faster and more efficient gain at lower cost than free-choice feeding.

Pelleting the complete mixed ration did not improve efficiency or reduce feed cost. The pelleted supplement appeared to be slightly superior to the meal form in terms of rate of gain, feed efficiency, and feed cost per unit of gain. Differences were very small. Pelleting ground milo reduced rate of gain and increased feed cost.

Grinding milo moderately fine improved rate of gain and efficiency and reduced the feed cost per unit of gain.

The Relative Value of Six Varieties of Milo For Growing and Finishing Swine

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In earlier tests conducted at this station (1954) the relative value of four varieties of milo varied from 93 to 98 percent of the value of Number 2 yellow corn. Kafir 44-14 had the highest relative value followed by Westland, Martin, and Redlan. The protein content of these varieties varied from 9.8 percent for the Kafir 44-14 to 12.0 percent for the Martin, a range of 2.2 percent. The lysine content of the protein in the grain varied from 2.35 to 2.92 percent, a variation of about 24 percent.

Many new varieties of milo are now grown in considerable quantities; therefore, it seemed desirable to test their characteristics as feed for swine. DeKalb F 62A, Kafir 44-14, Darset, R. S. 610, Redlan, and Amak R-12 were the varieties chosen. Certified seed of these varieties was obtained and planted in one area at the Fort Reno Station, to supply the grain used in these tests.

Two types of tests were conducted: (1) A palatability test in which pigs were given a choice between the six varieties of ground milo, and (2) a regular feeding trial in which replicate groups of pigs were fed the assigned variety of ground milo and a supplement free-choice.