

clusion at this time (April 20, 1949). It is becoming evident however that the lambs which are receiving their roughage in pelleted form are ruminating little or none, in contrast to those which are receiving coarsely ground hay. They also are consuming less concentrated feed. Bicarbonate of soda appears to have stimulated the appetite of the lambs receiving corn and alfalfa pellets.

The old digestive disturbances which have occurred to date have been of a mild form, evidenced by vomiting of corn by the lambs in lot 2 receiving the highly concentrated ration without soda.

Project 110: Swine Feeding Investigations

EXPERIMENT I—SUMMER 1948

C. E. Aubel

THE VALUE OF MUSTARD SEED OIL MEAL* AS A PROTEIN SUPPLEMENT FOR FATTENING PIGS ON ALFALFA PASTURE

Last year at the Livestock Feeders' Day, results of experiments were given on the use of mustard seed oil meal as a protein supplement for fattening pigs on alfalfa pasture. The results showed that mustard seed oil meal was an excellent protein feed when mixed with tankage and other protein supplements and self-fed free choice. Generally the gains were as cheap or cheaper than where tankage alone was fed and the daily gain were somewhat more rapid with a lower feed consumption.

In the tests reported last year the mustard seed oil meal made up as much as 50 percent of the protein mixtures with tankage in some of the lots and at this level proved to be entirely palatable. The results of feeding it in such large proportions were so satisfactory that it was desired to ascertain whether it were possible to increase further the amount of mustard seed meal in the mixture with tankage and still get good results. Consequently two lots of pigs were fed this past summer with an increased percentage of the mustard seed oil meal.

EXPERIMENTAL PROCEDURE

In the experiment reported herein, three lots of pigs were self-fed shelled corn, on a good stand of alfalfa pasture. Lot 1, the control lot, received 60 percent tankage self-fed. Lot 2 was self-fed a protein mixture of tankage 25 percent, mustard seed oil meal 75 percent. Lot 3 was self-fed a protein mixture of tankage 15 percent, mustard seed oil meal 85 percent. The alfalfa pasture was of excellent quality and ample at all times.

The following table gives a summary of the record of this experiment:

EXPERIMENT I—SUMMER 1948

THE VALUE OF MUSTARD SEED OIL MEAL IN PROTEIN FEED MIXTURES AS A SUPPLEMENT TO SHELLED CORN FOR FATTENING SPRING PIGS ON ALFALFA PASTURE

C. E. Aubel

* The mustard seed oil meal used in this experiment was furnished through the courtesy of the Kansas Soybean Mills Inc., Emporia, Kansas.

(June 10, 1948 to September 24, 1948—106 Days)

Ration	Shelled Corn (Self-fed) Alfalfa Pasture		
	Tankage (Self-fed)	Tankage 25% Mustard Seed 75% (Self-fed)	Tankage 15% Mustard Seed 85% (Self-fed)
Lot number:	1	2	3
Number pigs in lot:	10	10	9
Average Initial Weight per pig:	54.40 lbs.	58.00 lbs.	59.11 lbs.
Average Final Weight per pig:	250.20	231.75	206.33
Average Total Gain per pig	195.80	173.75	147.22
Average Daily Gain per pig:	1.84	1.63	1.38
Average Daily ration per pig:			
Shelled corn	6.41	5.84	5.33
Tankage	.42	.12	.06
Mustard Seed Meal		.38	.37
Feed Consumed per 100 pounds gain:			
Shelled Corn	347.03	356.83	395.26
Tankage	22.98	7.75	4.70
Mustard Seed Meal		23.27	26.69
Feed Cost per 100 pounds gain:	\$16.11	\$16.40	\$18.10

FEED PRICES CHARGED: Shelled corn, \$2.40 per bushel;
Tankage, \$110.00 per ton;
Mustard Seed Meal, \$70.00 per ton.

METHODS OF FEEDING: All lots were self-fed shelled corn. The protein supplements were mixed in the proportions indicated and self-fed in a separate compartment.

OBSERVATIONS AND CONCLUSIONS

- (1) Mustard seed oil meal when mixed with tankage at the rate of 75 percent mustard seed oil meal and 25 percent tankage and fed as a protein supplement did not make as rapid daily gains as was made by pigs receiving tankage as the only supplement. The tankage-alone fed pigs gained 1.85 pounds daily and the 75 percent-25 percent-supplement fed pigs gained 1.63 pounds. The amount of feed consumed per 100 pounds gain was larger with the 75-25 mixture than on tankage alone. The cost of gains likewise was a little greater because of this increased consumption. However, the gains were satisfactory.
- (2) When the supplementary mixture consisted of 85 percent mustard seed oil meal and 15 percent tankage, the rapidity of gains was further decreased, and the feed consumption was increased with a corresponding increased cost of 100 pounds gain.
- (3) From the results of this experiment it can be said that although feeding mustard seed oil meal up to 50 percent of the protein mixture gave excellent results, increasing it further to 75 and 85 percent had the affect of slowing the daily gains and increasing the amount of feed required for 100 pounds gain and increasing the

cost of those gains to such an extent that the use of such high percentages of mustard meal is not advisable in rations for fattening pigs on alfalfa pasture.

Project 110: Swine Feeding Investigations

Experiment II—Summer 1948

THE LIMITED FEEDING OF TANKAGE IN THE RATION OF FATTENING PIGS WHEN SELF-FED CORN ON ALFALFA PASTURE

C. E. Aubel

To produce swine profitably, it is necessary to make use of forage crops. This practice not only saves grain, but contributes to the general health of the hogs. Since swine feeders are seeking new and cheaper methods of producing hogs on pasture, the limited feeding of tankage for fattening pigs on alfalfa pasture was studied in this feeding trial.

How The Hogs Were Fed

Spring pigs were fed from an average weight of about 55 pounds in four lots for a period of 106 days on alfalfa pasture, starting on June 10, 1948. Ten pigs were fed in each lot. All pigs were provided with plenty of good alfalfa pasture during the entire feeding period and had shelled corn, self-fed, free choice.

The difference in treatment was the feeding of a 60 per cent protein tankage supplement during different periods of growth and fattening in the four lots. The tankage was self-fed, free choice with the corn.

The Tankage Supplement Allowance

- Lot 1. No supplement during the feeding period.
- Lot 2. Sixty percent tankage, until the pigs had an average weight of 100 pounds (first 32 days on feed)—none thereafter.
- Lot 3. Sixty percent tankage until the pigs had an average weight of 150 pounds (first 61 days on feed)—none thereafter.
- Lot 4. Sixty percent tankage during the entire feeding period of 106 days.

A summary of the results follows:

Experiment II—Summer 1948

THE LIMITED FEEDING OF TANKAGE IN THE RATION OF FATTENING PIGS WHEN SELF-FED CORN ON ALFALFA PASTURE

C. E. Aubel

(June 10, 1948 to September 4, 1948—106 Days)

Rations	Tankage (Self-fed) Throughout Entire Period.	Tankage (Self-fed) First 61 Days, Weight 150 lbs...	Tankage (Self-fed) First 32 Days, Weight 100 lbs.	Tankage (Self-fed) First 32 Days, Weight 100 lbs.
Lot Number	1	2	3	4
Number of pigs per lot	10	10	10	10
Average Initial Weight per pig	Pounds 55.90	Pounds 57.15	Pounds 56.40	Pounds 54.40
Average Final Weight per pig	158.95	201.55	224.90	250.20
Average Total Gain per pig	103.05	144.40	168.50	195.80

(Continued from preceding page)

Average Daily Gain per pig	.97	1.36	1.58	1.84
Average Daily Ration per pig:				
Corn	3.57	4.11	5.85	6.41
Tankage		.25*	.32†	.42x
Feed Required for 100 pounds gain				
Corn	367.78	301.93	368.24	347.03
Tankage		5.74x	11.86x	22.98
Feed cost per 100 pounds gain	\$15.74	\$13.24	\$16.41	\$16.11

*—Figured on 32 day basis

†—Figured on 61 day basis

x—Figured on 106 day basis

FEED PRICES CHARGED: Shelled corn, \$2.40 per bushel;
Tankage, \$110.00 per ton.

METHODS OF FEEDING: All lots were self-fed shelled corn, on alfalfa pasture. The tankage was self-fed the number of days showing in the table, then the pigs received only shelled corn.

Observations

- (1) The maximum use of alfalfa pasture without other protein supplement produced low cost gains.
- (2) Full feeding the protein supplement free choice with the fattening ration of corn and alfalfa pasture increased the rate of gain of the hogs. As the protein feeding period was lengthened, the rate of gain for the entire feeding period was increased.
- (3) The protein supplement was used most effectively in the shorter feeding period where it was omitted from the ration after the hogs had reached the weight of 100 pounds. With this plan of feeding the rate of gain was fairly high and the feed cost low. Feeding the protein for longer periods increased the total feed requirement and cost of gain, although the rate of gain was increased.

Conclusions

The results of these experiments show that hogs will gain efficiently on a full-feed of corn and good alfalfa pasture, without receiving a protein supplement after they have reached a weight of 100 pounds.

The results show further that the feed cost of gains can be kept at a comparatively low figure by omitting the protein supplement from the ration in the beginning. The rate of gain, however, is reduced with this plan of feeding.

If maximum gains are desired despite the higher cost, the protein supplement should be full-fed throughout the fattening period. This speed up in gaining should insure an earlier market with corresponding higher selling price.

Project 217—Meat Investigations,—I, Chemical and Physical Properties of Meat and Their Relationship to Palatability Factors.

Project 260—Factors Influencing the Keeping Qualities and Nutritional Value of Frozen Meat.

MEAT INVESTIGATIONS

David L. Mackintosh and D. B. Watt

The enormous increase in the use of frozen foods and in the num-