

Duplicate

LIBRARY RECEIVED

DEC 6 1924

U.S. Department of Agriculture
JUNE, 1924

0
15
BULLETIN No. 223

Peanuts for Fattening Hogs in the Dry Lot

By

J. C. GRIMES AND W. D. SALMON

AGRICULTURAL EXPERIMENT STATION

of the

ALABAMA POLYTECHNIC INSTITUTE

M. J. FUNCHESS, *Director*

AUBURN

PEANUTS FOR FATTENING HOGS IN THE DRY LOT

By

J. C. GRIMES AND W. D. SALMON

INTRODUCTION

With the tendency toward diversification of crops in the South in the last decade, the peanut has become an important crop. The estimated acreage planted to this crop in Alabama in 1909 was 100,500 acres. This includes area interplanted in corn. By 1918 the acreage had increased to 1,072,000 acres. In 1922 there were only 487,000 acres in the State, but this acreage was exceeded by only three crops—corn, cotton and hay (Statistics from Alabama Markets Journal, Volume VII, Number 7).

Early in the history of peanut growing on an extensive scale, it was found that an acre of this crop would produce a large amount of pork. During periods of extremely low prices for peanuts, a rather large part of the production found its way to market through hogs.

When the series of experiments reported in the following pages was started in 1920, the price of peanuts was around \$27.00 a ton for farmers' stock. Peanut-fed hogs were selling at \$8.00 to \$9.00 a hundred pounds. As will be shown later, hogs at the above prices will return \$45.00 to \$50.00 a ton for peanuts. Obviously it was a very profitable practice to feed peanuts to hogs at that time. This year (1923), with the previous year's crop of peanuts selling at around \$70.00 a ton at harvest time, and hogs at \$6.00 to \$7.00 a hundred, it was evident that they could not be fed to hogs at a profit. However, it was thought that this series of experiments should be completed and the results published.

* The experiments reported herein were conducted on the farm of Parke Thompson, Goshen, Alabama. Mr. Thompson did the feeding and kept the records. G. L. Burleson assisted in supervising the work in 1920-21. The expenses of the experiments were defrayed by the State Local Experiment Fund.

OBJECTS OF EXPERIMENT

1. To determine the amount of picked runner peanuts required to produce 100 pounds of gain on fattening hogs in the dry lot.

2. To compare the relative feeding value of runner peanuts alone; peanuts and corn; peanuts and tankage; and peanuts, corn and tankage.

3. To test the influence of the above rations on the quality of the carcass.

PROCEDURE

Animals Used.—All hogs were purebred Poland Chinas of the large type.

Quarters.—The quarters were dry lots containing shelter.

Weighing.—Individual weights were made at the beginning and every 28 days throughout the test.

Rations.—The following rations were fed:

Lot 1.	Runner peanuts, self-fed
Lot 2.	{ Runner peanuts Shelled corn Free choice
Lot 3.	{ Runner peanuts 60% tankage Free choice
Lot 4.	{ Runner peanuts Shelled corn 60% tankage Free choice

Water and Minerals.—The hogs had access at all times to water and to a simple mineral mixture composed of equal parts by weight of air slaked lime, salt, and charcoal.

TABLE I.—*Summary of First Experiment*
December 14, 1920, to March 21, 1921—97 Days

	Lot 1	Lot 2	Lot 3	Lot 4
	Peanuts Minerals* Self-fed	Peanuts Shelled corn Minerals* Free choice	Peanuts Tankage Minerals* Free choice	Peanuts Shelled corn Tankage Minerals* Free choice
Number of hogs to lot ----	6	6	6	6
	Lbs.	Lbs.	Lbs.	Lbs.
Av. initial weight -----	116	117	116	117
Av. final weight -----	309	282	317	300
Av. daily gain per hog ---	1.98	1.69	2.06	1.88
Av. daily feed per hog:				
Runner peanuts -----	7.07	4.15	7.30	5.45
Shelled corn -----	-----	3.15	-----	2.20
60% tankage -----	-----	-----	0.12	0.12
Total -----	7.07	7.30	7.42	7.77
Feed for 100 lbs. gain:				
Runner peanuts -----	356	247	354	290
Shelled corn -----	-----	183	-----	117
60% tankage -----	-----	-----	5.7	6.3
Total -----	356	430	359.7	413.3
Feed cost 100 lbs. gain --	\$5.34	\$7.36	\$5.48	\$6.89

Prices of Feeds:

Peanuts \$30 a ton
Corn \$1.12 a bushel
Tankage \$65 a ton

* Unfortunately a record of the amount of mineral mixture consumed was not kept in any of these experiments.

DISCUSSION OF RESULTS—FIRST EXPERIMENT

Table I shows a summary of the first experiment. Peanuts with no supplement except a simple mineral mixture, free access, produced very satisfactory gains. The increase in the rate of gain where tankage was supplied in addition to the above ration was not great enough to be significant. When corn replaced part of the peanuts in either of the above rations the rate of gain was decreased.

Less feed was required for 100 pounds of gain and the gains were less expensive on the ration of peanuts and minerals than when either corn or tankage, or both, were added. At the time of this experiment corn was \$1.12 a bushel, or \$48.00 a ton, and peanuts were \$30.00 a ton.

These hogs were slaughtered at the plant of Swift & Company, Andalusia, Alabama. All carcasses were soft or oily.

TABLE II.—*Summary of Second Experiment*
February 8 to April 23, 1922—75 Days

	Lot 1	Lot 2	Lot 3	Lot 4
	Peanuts Minerals Self-fed	Peanuts Shelled corn Minerals Free choice	Peanuts Tankage Minerals Free choice	Peanuts Shelled corn Tankage Minerals Free choice
Number of hogs to lot ----	6	6	6	6
	Lbs.	Lbs.	Lbs.	Lbs.
Av. initial weight -----	76.0	75.8	75.3	75.3
Av. final weight -----	194.8	199.5	212	227
Av. daily gain per hog --	1.58	1.65	1.82	2.02
Av. daily feed per hog:				
Runner peanuts -----	5.65	4.82	6.38	5.51
Shelled corn -----		1.90		1.73
60% tankage -----			0.40	0.21
Total -----	5.65	6.72	6.78	7.45
Feed for 100 lbs. gain:				
Runner peanuts -----	356.9	292.0	349.7	272.5
Shelled corn -----		115.3		85.6
60% tankage -----			21.6	10.9
Total -----	356.9	407.3	371.3	369.0
Feed cost 100 lbs. gain --	\$8.92	\$8.85	\$9.49	\$8.33

Prices of Feeds:

Peanuts \$50 a ton

Corn 75 cents a bushel

Tankage \$70 a ton

DISCUSSION OF RESULTS—SECOND EXPERIMENT

It will be observed that all lots in this experiment receiving supplements in addition to peanuts and minerals made larger gains than the lot receiving only peanuts and minerals. The hogs on peanuts and minerals did not gain as rapidly as those on the same ration in the first experiment. In other words, the supplements seemed to have a more beneficial effect in the second experiment. This may have been due in part to the use of younger hogs in the second experiment. Mr. Thompson reported that there was a little grass in Lot 4 during the latter part of the experiment which might have made this lot show up better in the second experiment than in the first.

As in the first experiment the efficiency of the peanut-mineral ration was demonstrated by the small amount of this ration required for 100 pounds of gain. The feed requirement for 100 pounds of gain was increased when corn or tankage was added.

Since corn was cheaper than peanuts at the time of this experiment, the feed cost of 100 pounds of gain was reduced by replacing part of the peanuts with corn. The cost of the gains was increased by adding tankage to the ration of peanuts and minerals but decreased by adding tankage to the ration of peanuts, corn, and minerals.

The hogs from the second experiment were slaughtered at the plant of the Birmingham Packing Company, Birmingham, Alabama. All carcasses were soft or oily. The carcasses of lots 1 and 3 appeared somewhat softer than those of lots 2 and 4 but there was not enough difference to affect the commercial value.

TABLE III.—*Summary of Third Experiment*
February 2 to April 3, 1923—60 Days

	Lot 1	Lot 2	Lot 3	Lot 4
	Peanuts Minerals Self-fed	Peanuts Shelled corn Minerals Free choice	Peanuts Tankage Minerals Free choice	Peanuts Shelled corn Tankage Minerals Free choice
Number of hogs to lot ----	6	6	6	6
	Lbs.	Lbs.	Lbs.	Lbs.
Av. initial weight -----	122.0	122.6	120.5	122.5
Av. final weight -----	274	268	285	279
Av. daily gain per hog --	2.54	2.42	2.74	2.61
Av. daily feed per hog:				
Runner peanuts -----	9.45	4.75	9.60	6.01
Shelled corn -----	-----	4.83	-----	3.53
60% tankage -----	-----	-----	0.16	0.12
Total -----	9.45	9.58	9.76	9.66
Feed for 100 lbs. gain:				
Runner peanuts -----	372.6	196.0	350.2	230.8
Shelled corn -----	-----	199.4	-----	135.4
60% tankage -----	-----	-----	5.9	4.7
Total -----	372.6	395.4	356.1	370.9
Feed cost 100 lbs. gain --	\$13.04	\$10.41	\$12.47	\$10.64

Prices of Feeds:
Peanuts \$70 a ton
Corn \$1 a bushel
Tankage \$75 a ton.

DISCUSSION OF RESULTS—THIRD EXPERIMENT

Table III is a summary of the third experiment. It will be observed that these hogs made very rapid gains on all the rations used. As in the first experiment, the ration of peanuts, tankage, and minerals produced the largest gains and peanuts, corn, and minerals the smallest. The order of the other two rations was reversed in the two experiments; but, in either case, the difference in the rate of gain was slight. It was only in the second experiment that peanuts, corn, tankage, and minerals produced noticeably larger gains than peanuts and minerals. This may have been due in part, as mentioned before, to the grass in the peanut-corn-tankage lot.

The peanuts fed in this test were somewhat lower in quality than those in the two previous tests and more of them were required for 100 pounds of gain.

When the cost of 100 pounds of gain is considered the rations containing the smallest amount of peanuts were the most economical. In this experiment we have a reversal of the conditions of the first experiment from a monetary standpoint. This is due to a change in the relative prices of corn and peanuts. When conditions are such that the cost of gains is reduced by the addition of corn and tankage to a ration of peanuts, the indication is not that this addition should be made. It is rather an indication that the peanuts should be sold and a corn-tankage ration fed.

These hogs were sold to a local dealer. Slaughter data were not obtained, as the results of the two former experiments showed that these rations produced soft or oily carcasses.

SUMMARY OF RESULTS

A summary showing average results of the three experiments reported above is shown in Table IV.

TABLE IV.—*Summary of Three Years' Results*
Average Length of Experiment—77 Days

	Lot 1	Lot 2	Lot 3	Lot 4
	Peanuts Minerals Self-fed	Peanuts Shelled corn Minerals Free choice	Peanuts Tankage Minerals Free choice	Peanuts Shelled corn Tankage Minerals Free choice
Number of Hogs Used ----	18	18	18	18
	Lbs.	Lbs.	Lbs.	Lbs.
Av. initial weight -----	104.6	105.1	103.9	104.9
Av. final weight -----	259.2	249.8	271.3	268.6
Av. daily gain per hog --	2.00	1.87	2.16	2.12
Av. daily feed per hog:				
Runner peanuts -----	7.23	4.50	7.60	5.62
Shelled corn -----		3.17		2.32
60% tankage -----			0.22	0.15
Total -----	7.23	7.67	7.82	8.09
Feed for 100 lbs. gain:				
Runner peanuts -----	361	241	352	265
Shelled corn -----		170		109
60% tankage -----			10	7
Total -----	361	411	362	381
Feed cost 100 lbs. gain --	\$8.69	\$8.82	\$8.82	\$8.55

Prices of Feeds:

Peanuts \$48.14 a ton

Corn \$1 a bushel

Tankage \$70 a ton

DISCUSSION OF RESULTS—AVERAGE OF THREE
EXPERIMENTS

Table IV shows a summary of the average results from the three experiments.

It is very interesting to note the gains made on a ration of peanuts with no supplement except a simple mineral mixture. It indicates that this is a satisfactory ration for hogs the size of those used in these experiments. The gains were only slightly larger when tankage, or corn and tankage, were added to the peanut-mineral ration. When corn alone was added, the result was smaller gains.

The efficiency of the peanut-mineral ration is again brought out in the amount of feed required for 100 pounds of gain. The lot receiving this ration showed the smallest feed requirement for 100 pounds of gain. The lot receiving peanuts and tankage ranked second; the lot receiving peanuts, corn and tankage, third; and the lot receiving peanuts and corn, fourth.

The feed cost of 100 pounds gain, with feeds at the average prices for the three experiments, (peanuts \$48.14 a ton, corn \$1.00 a bushel, and tankage \$70.00 a ton) was as follows:

Lot 4. Peanuts, corn and tankage -----	\$8.55
Lot 1. Peanuts -----	\$8.69
Lot 2. Peanuts and corn -----	\$8.82
Lot 3. Peanuts and tankage -----	\$8.82

Figures covering the financial outcome of the experiments are not included, as they are not considered significant in interpreting and applying the data to conditions that may exist at any time in the future. The feeder is interested only in knowing what results he may expect from a given ration in terms of average daily gains and amount of feed required for 100 pounds of gain. With these figures and the current prices of feedstuffs, he has a basis for an estimate of the financial outcome of a feeding operation at any given time.

For the convenience of the reader, Table V, showing the cost of 100 pounds of gain from peanuts at various prices, has been prepared.

TABLE V.—*Cost of Producing 100 Pounds of Gain in Dry Lot from Peanuts at Various Prices **

Cost of Peanuts a Ton	Cost of 100 Pounds Gain
\$30.00	\$ 5.41
\$40.00	\$ 7.22
\$50.00	\$ 9.02
\$60.00	\$10.83
\$70.00	\$12.63
\$80.00	\$14.42

* Peanuts, self-fed, in dry lot with mineral supplement. Feeder hogs weighing 100 pounds at beginning of fattening period and fed for an average of 150 pounds gain.

Table V applies to peanuts fed in the dry lot with no supplement except mineral matter. It is based on the results of the three experiments reported in the preceding pages in which 361 pounds of runner peanuts produced 100 pounds of gain. This is 554 pounds of gain from a ton of peanuts.

When peanuts are grazed, the cost of 100 pounds of gain will be much less than the figures shown. Data previously collected at the Alabama Experiment Station indicate that 2 pounds of peanuts plus the tops

grazed in the field will produce a pound of gain (Alabama Station Bulletin No. 206). Based on these figures, the cost of 100 pounds of gain from hogs grazed on peanuts would be one-tenth of the price of a ton of peanuts. The labor saved when peanuts are hogged off instead of harvested and the considerable quantity of fertilizing constituents returned to the soil must also be taken into consideration. This phase of peanut feeding will be covered in a later publication.

VALUE OF PEANUTS COMPARED WITH CORN AND TANKAGE AT VARYING PRICES

In view of the results reported in the previous pages, it appears that it would never be a good practice to supplement peanuts in the dry lot with corn and tankage, either separately or in combination. Peanuts produce rapid and efficient gains when supplemented with mineral matter only. However, hogs fed this ration kill "soft." Under average conditions, corn and tankage may be expected to produce "hard" carcasses.

Supplementing the peanut ration with corn and tankage when all feeds were self-fed did not improve the quality of the carcass sufficiently to increase the commercial value. Therefore, if 100 pounds of gain can be produced on peanuts cheaply enough to allow for the "dock" on soft hogs and still be more profitable than the production of "hard" hogs on a corn-tankage ration, it is obvious that the peanut ration should be used. On the other hand, if the prices of feeds are such that the cost of 100 pounds of gain would be decreased by the addition of corn and tankage to a peanut ration, it would be more profitable to replace the peanut ration entirely with a corn-tankage ration.

To serve as a basis for comparing a peanut ration with a corn and tankage ration, Table VI, was prepared. This table is based on the data obtained in these experiments for peanuts, showing that 1 ton of peanuts supplemented with mineral matter produced 554 pounds of gain on hogs in the dry lot. Data from 15 experiments at 6 experiment stations show that 37.59 bushels of shelled corn and 221.6 pounds of tankage were required to make an equivalent gain under dry lot conditions. *

* Ind. Sta. Bul. 137; Iowa Sta. Bul. 91; Neb. Sta. Bul. 147; Mo. Sta. Bul. 65; Kans. Sta. Bul. 192; Ohio Sta. Bul. 209.

In applying Table VI, it is necessary to make a correction for the difference in the value of hard and soft hogs. To do this, multiply the difference in price per hundred pounds liveweight by 5.5, and subtract from the value of a ton of peanuts, as shown in Table VI. This is because Table VI is based on the relative amounts of the two rations required to produce 554 pounds live pork; hence, the correction merely represents the difference in value of this amount of hard pork and soft pork. If corn is \$1.00 a bushel and tankage \$70.00 a ton, and hard hogs are worth \$2.00 a hundred more than soft hogs, the feeding value of a ton of peanuts will be \$34.36, instead of \$45.36, as shown in Table VI. ($\$45.36 - 5.5 \times \$2 = \$34.36$.)

TABLE VI.—*Value of a Ton of Peanuts for Hogs Fed in the Dry Lot Compared with Corn and Tankage at Varying Prices **

Corn per bushel ----	70c	80c	90c	\$ 1.00	\$ 1.10	\$ 1.20
Tankage per ton						
\$60 -----	\$32.97	\$36.73	\$40.49	\$44.25	\$48.01	\$51.77
\$70 -----	\$34.08	\$37.84	\$41.60	\$45.36	\$49.12	\$52.88
\$80 -----	\$35.19	\$38.95	\$42.71	\$46.47	\$50.23	\$53.99
\$90 -----	\$36.30	\$40.06	\$43.82	\$47.58	\$51.34	\$55.10

* From the above figures deduct 5.5 times the difference in price of 100 pounds of soft hogs and 100 pounds of hard hogs. This gives the true value of a ton of peanuts based on their replacement value for corn and tankage.

POINTS OF INTEREST

1. Hogs made good gains on peanuts supplemented with mineral matter only.
2. The rate of gain was slightly increased by supplementing peanuts with tankage, or with corn and tankage. It was decreased by supplementing peanuts with corn only. Minerals were supplied in all cases.
3. Supplementing peanuts with corn and tankage, singly or together, increased the amount of feed required for 100 pounds of gain.
4. All the rations used produced soft carcasses.
5. When peanuts cost \$50.00 a ton, 100 pounds of gain on peanuts and mineral matter cost \$9.02. (See Table V.)

6. When corn is \$1.00 a bushel, tankage \$70.00 a ton, and corn-tankage fed hogs are worth \$2.00 a hundred more than peanut fed hogs, a ton of peanuts is worth approximately \$34.36 for hog feed (See Table VI).

7. These experiments indicate that it would never pay to supplement peanuts with corn and tankage, either singly or together.

8. If the prices of feeds are such that the cost of 100 pounds of gain is decreased by the addition of corn and tankage, peanuts should not be used in the ration, but should be sold and replaced with corn and tankage.

The results reported in these pages apply to dry lot feeding only.