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Garbage Supplements Fed to Hogs at Prairie View State College

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GARBAGE SUPPLEMENTS FED TO HOGS
AT PRAIRIE VIEW STATE COLLEGE

by

William Howell Smith

A Thesis in Animal Husbandry Submitted in
Partial Fulfillment of the Requirements
for the Degree of

Bachelor of Science

in the
Division of Agriculture

of the

Prairie View State Normal and Industrial College

Prairie View, Texas

May, 1936

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This experiment was inspired by Professor S. H. Settler instructor of animal husbandry at Prairie View State College, Prairie View, Texas, and was guided by him at each stage of its development. Through his wonderful suggestions, personality friendship and former instructions, the writer has been able to make of this experiment just what it is, and hereby wishes to affectionately and respectfully dedicate this thesis to him.

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CHAPTER I

GARBAGE SUPPLEMENT FED TO HOGS AT PRAIRIE VIEW STATE COLLEGE

INTRODUCTION

Garbage is fed to hogs at Prairie View State College with varying degrees of success. The results of the experiment given in this Thesis is intended to familiarize interested persons with the possibilities of the business when it is intelligently managed. Very little work has been done on this feeding of garbage supplements to hogs by any experiment stations or any college due to the varying composition of garbage.

Feeding garbage supplements to hogs in a proper manner makes possible the conversion of the waste from the Prairie View State College Dining Hall into wholesome meat, thus giving back to the Dining Hall a supply of pork and at the same time affording the Dining Hall an economical and efficient method of garbage disposal.

Garbage, ordinarily, is all refuse accumulation of animal or vegetable matter which had been intended for human food. It is generally composed of scraps, peelings, fruit remnants bread, meat and other spoiled food, and is quite variable in composition. The composition of garbage depends largely on its origin and the season of the year. Most garbage is more or less a balanced ration.

Of 66 cities estimated as having populations in excess by 100,000 each in 1916 more than 30 per cent reported that their garbage was disposed of by feeding to hogs, and of the 544 cities of between 10,000 and 100,000 from which reports were received by the United States Food Administration, more than 36 per cent made like reports. This means that even when the production in cities of less than 10,000 inhabitants is not considered, nor the suburban farm population and college which disposes of almost all its garbage by feeding, the waste food products from over 8 million people are being fed to hogs. This product is sufficient if handled and fed under ideal conditions, to produce approximately 80,000,000 pounds of pork

each year at little or no cost. But experience shows that in actual practice scarcely more than 50% efficiency may be expected, which means that about 40,000,000 pounds of garbage fed pork is sold each year. Why is the efficiency rate so low? The purpose of this experiment is to supplement other feedw with garbage. In other workd supplement corn and cotton seed meal with garbage and attempt to get better results which will in turn promote a higher degree of efficiency in the utilization of garbage and eliminate the common belief, that the value of garbage will not be sufficient to pay the cost of collection and transportation.

There is a difference of opinion among some garbage feeders as to the relative merits of hogs raised on garbage from the time of weaning and those purchased on the market about 100 pounds in weight; some assert that the garbage fed hog has not the strength of the other hog.

A hog accustomed to garbage early in his life should be the more successful as a rule. The feed is more bulky than grain and requires a greater stomach capacity if the same amount

of nourishment is to be consumed. The hog raised on garbage is started or a garbage fed pig, and his stomach is capable of being extended far beyond that of a grain fed hog of equal age. Practically every breed of hog is fed successfully of garbage a satisfactory result may be obtained with any breed; management is the essential factor. Some tests show that a gain of about a pound a day can be expected with growing hogs fed on garbage with plenty of range, provided there are no losses. This means roughly that a ton of garbage will produce 100 pounds of gain on a live-weight basis.

The feeding value of garbage, especially the better grades, is such that it is seldom economical to use a grain supplement. Greater gains per day can be made with grain supplement, but at a greater cost.

In carrying out this experiment fifteen (15) Duroc Jersey pigs were used, thirteen (13) barrows and two (2) gilts. They were distributed in three pens, five in each pen. In pen number I garbage alone was fed. In pen number II corn and garbage was fed. In pen number III garbage and cotton seed

meal was fed. The pigs in pens I, II, and III were fed twice each day all the garbage they could eat. In pen number II seven pounds of corn was fed together with the garbage once each day. In pen number III four pounds of cotton seed meal was fed once each day, separate from the garbage. The pigs, at the beginning of the experiment were fed three times and the average weight of the three weighings of each pig was the weight used. The pigs were numbered from 1 to 15. That is on the ear of each of the fifteen pigs a niche was made indicating his number. This method was used in identifying the pigs throughout the experiment. The first day's weights of the pigs were as follows:

PEN NUMBER III

Pig number	Weight	Sex
14	45 pounds	Girl
8	41 pounds	Barrow
11	57 pounds	Barrow
12	58 pounds	Barrow
13	56 pounds	Barrow

PEN NUMBER I

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Pig number	Weight	Sex
2	46 pounds	Barrow
10	55 pounds	Barrow
3	47 pounds	Barrow
4	50 pounds	Barrow
7	40 pounds	Gilt

PEN NUMBER II

Pig number	Weight	Sex
5	53 pounds	Barrow
6	54 pounds	Barrow
1	34 pounds	Barrow
9	40 pounds	Barrow
15	45 pounds	Barrow

PEN NUMBER III

Pig number	Weight	Sex
14	46 pounds	Gilt
8	41 pounds	Barrow
11	39 pounds	Barrow
12	52 pounds	Barrow
13	59 pounds	Barrow

To successfully weigh the pigs a large barrel was used, each pig was placed in the barrel and the gross weight taken, and net weight subtracted. On the second day the pigs were weighed again. The weights were as follows:

1	50 pounds	Barrow
2	41 pounds	Gilt

PEN NUMBER II

Pig number	Weight	Sex
6	54 pounds	Barrow
7	55 pounds	Barrow
1	34 pounds	Barrow
8	40 pounds	Barrow
16	44 pounds	Barrow

PEN NUMBER III

Pig number	Weight	Sex
14	45 pounds	Gilt
8	48 pounds	Barrow
11	39 pounds	Barrow
12	51 pounds	Barrow
13	58 pounds	Barrow

PEN NUMBER I

Pig number	Weight	Sex
2	47 pounds	Barrow
10	54 pounds	Barrow
3	47 pounds	Barrow
4	50 pounds	Barrow
7	41 pounds	Gilt

PEN NUMBER II

Pig number	Weight	Sex
5	54 pounds	Barrow
6	55 pounds	Barrow
1	34 pounds	Barrow
9	40 pounds	Barrow
15	44 pounds	Barrow

PEN NUMBER III

Pig number	Weight	Sex
14	45 pounds	Gilt
8	42 pounds	Barrow
11	39 pounds	Barrow
12	51 pounds	Barrow
13	58 pounds	Barrow

PEN NUMBER I

During the three days that the pigs were being weighed, they were not fed. Clean fresh water was kept in each pen. On the third day the final weights were taken. They were as follows:

Pig number	Weight	Sex
1	41 pounds	Barrow
2	40 pounds	Barrow
3	41 pounds	Barrow

PEN NUMBER II

Pig number	Weight	Sex
4	40 pounds	Barrow
5	34 pounds	Barrow
6	33 pounds	Barrow
7	39 pounds	Barrow
8	44 pounds	Barrow

PEN NUMBER III

Pig number	Weight	Sex
9	44 pounds	Barrow
10	42 pounds	Barrow
11	39 pounds	Barrow
12	32 pounds	Barrow
13	32 pounds	Barrow

PEN NUMBER I

Pig number	Weight	Sex
2	48 pounds	Barrow
10	54 pounds	Barrow
3	47 pounds	Barrow
4	51 pounds	Barrow
7	40 pounds	Gilt

PEN NUMBER II

Pig number	Weight	Sex
5	53 pounds	Barrow
6	54 pounds	Barrow
1	53 pounds	Barrow
9	39 pounds	Barrow
15	44 pounds	Barrow

PEN NUMBER III

Pig number	Weight	Sex
14	44 pounds	Gilt
8	42 pounds	Barrow
11	38 pounds	Barrow
13	58 pounds	Barrow
12	50 pounds	Barrow

On the fourth day the feeding was begun. In pen number I, garbage only was fed. In pen number II garbage and corn were fed. In pen number III, garbage and cotton seed meal were fed. The pigs were fed the following amounts once each day for a period of 15 days:

PEN NUMBER I - All the garbage the pigs could consume.

PEN NUMBER II - All the garbage the pigs could eat and 7 pound of shelled corn.

PEN NUMBER III - All the garbage the pigs could eat and 4 pounds of cotton seed meal.

In each pen sufficient amounts of clean fresh water was kept at all times.

The garbage was fed in large wooden troughs, large enough to hold sufficient amounts with our wasting. The supplementary feeds for t pens number II and III, corn and cotton seed meal respectively, were fed in separate troughs. Each was kept thoroughly clean, and all were 5' x 11' in size, with concrete floors, each pen was equiped with a top that extended over half the area of each pen. Thus, affording protection against bad weather and also allowing plenty of sunlight and fresh air.

Garbage only fed

At the beginning of the experiment each pig was found to be infected with lice. To rid the pigs of lice, they were dipped thoroughly in a barrell containing black oil which was quite effective.

The weight of each pig on the day feeding was begun:

Pig Number II

Garbage and corn fed

Pig number	Weight	Sex
5	53 pounds	Barrow
6	54 pounds	Barrow
7	53 pounds	Barrow
8	60 pounds	Barrow
12	46 pounds	Barrow

Pig Number III

Garbage and cotton seedmeal fed

Pig number	Weight	Sex
14	43 pounds	gilt
9	41 pounds	Barrow
11	35 pounds	Barrow
10	38 pounds	Barrow
13	41 pounds	Barrow

PEN NUMBER I

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Garbage only fed

Pig number	Weight	Sex
2	47 pounds	Barrow
10	53 pounds	Barrow
3	47 pounds	Barrow
4	50 pounds	Barrow
7	40 pounds	Gilt

PEN NUMBER II

Garbage and corn fed

Pig number	Weight	Sex
5	53 pounds	Barrow
6	54 pounds	Barrow
1	33 pounds	Barrow
9	40 pounds	Barrow
15	44 pounds	Barrow

PEN NUMBER III

Garbage and cotton seedmeal fed

Pig number	Weight	Sex
14	45 pounds	Gilt
8	41 pounds	Barrow
11	38 pounds	Barrow
13	58 pounds	Barrow
12	51 pounds	Barrow

Average total weight of pigs in pen number I

45.40 pounds

Average total weight of pigs in pen number II

54.80 pounds

Average total weight of pigs in pen number III

46.60 pounds

Pig number	Weight	Sex	Gain
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The pigs were weighed again, and thereafter at intervals of every 15 days. The weights of the pigs at the end of 15 days were as follows:

56 pounds	Barrow	8 pounds
46 pounds	Gilt	8.1 pounds

AVERAGE GAIN PEN NUMBER I 8.40 POUNDS

PEN NUMBER II
Garbage and Corn fed

Pig number	Weight	Sex	Gain
------------	--------	-----	------

60 pounds	Barrow	12 pounds
62 pounds	Barrow	8 pounds
46 pounds	Barrow	9 pounds
49 pounds	Barrow	11 pounds
51 pounds	Barrow	9 pounds

AVERAGE GAIN PEN NUMBER II 8.13 POUNDS

PEN NUMBER III
Garbage and cotton seed meal fed

Pig number	Weight	Sex	Gain
------------	--------	-----	------

54 pounds	Gilt	9 pounds
45 pounds	Barrow	4 pounds
45 pounds	Barrow	5 pounds
54 pounds	Barrow	5 pounds
51 pounds	Barrow	5 pounds

AVERAGE GAIN PEN NUMBER III 6.9 POUNDS

PEN NUMBER I
Garbage only fed

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Pig number	Weight	Sex	Gain
2	52 pounds	Barrow	3 pounds
10	62 pounds	Barrow	9 pounds
3	49 pounds	Barrow	2 pounds
4	56 pounds	Barrow	8 pounds
7	46 pounds	Gilt	6.1 pounds

AVERAGE GAIN PEN NUMBER I 8.40 POUNDS

PEN NUMBER II
Garbage and Corn fed

Pig number	Weight	Sex	Gain
5	60 pounds	Barrow	12 pounds
6	62 pounds	Barrow	8 pounds
1	46 pounds	Barrow	9 pounds
9	49 pounds	Barrow	11 pounds
15	51 pounds	Barrow	9 pounds

AVERAGE GAIN PEN NUMBER II 8.13 POUNDS

PEN NUMBER III
Garbage and cotton seed meal fed

Pig number	Weight	Sex	Gain
14	54 pounds	Gilt	9 pounds
8	45 pounds	Barrow	4 pounds
11	43 pounds	Barrow	5 pounds
12	54 pounds	Barrow	5 pounds
13	61 pounds	Barrow	5 pounds

AVERAGE GAIN PEN NUMBER III 6.9 POUNDS

TOTALS FOR 15 DAYS

PEN NUMBER	I	II	III
Average total Weight	53.1 pounds	53.60 pounds	50.40 pounds
Average total gain	8.40 pounds	8.13 pounds	6.9 pounds
Average daily gain	.560 pounds	.542 pounds	.460 pounds

of the pigs. The garbage was picked up from the kitchen once each day in large barrels, each barrel containing about 300 pounds of garbage of which approximately 200 pounds were consumable, while the rest was glass, and paper napkins which the pigs would not eat. Most of the garbage feed was semi-liquid.

At the expiration of thirty (30) days the pigs were weighed again. The weights were as follows:

The pigs in pens number II and III ate little if any of the supplementary feed, and it was necessary to mix the supplementary feed along with the garbage until the pigs had become accustomed to them. The pigs in both pens that up eating garbage, and such other feed as they could find in wooded pastures. The pigs in each pen would consume an average of several gallons of water each day which was probably due to the garbage feeding. Although the garbage fed would c contain large quantities of broken glass, plates and tin, no injuries or damage was done to any of the pigs. The garbage was picked up from the kitchens once each day in large barrells, each barrell containing about 300 pounds of garbage of which approximately 250 pounds were consumable, whild the rest was glass, and paper napkins which the pigs would not eat. Most of the garbage feed was semi-liquid.

At the expiration of thirty (30) days the pigs were weighed again. The weights were as follows:

PEN NUMBER I

Garbage only fed

Pig number	Weight	Sex	Gain
2	69 lbs.	Barrow	9 lbs
10	78 "	Barrow	10 "
3	61 "	Barrow	8 "
4	70 "	Barrow	9 "
7	62 "	Gilt	10 "

PEN NUMBER II
Garbage and Corn fed

Pig number	Weight	Sex	Gain
5	79 lbs.	Barrow	14 lbs.
6	80 "	Barrow	12 "
1	62 "	Barrow	12 "
9	66 "	Barrow	8 "
15	69 "	Barrow	9 "

PEN NUMBER III
Garbage and cotton seed meal fed

Pig number	Weight	Sex	Gain
14	70 lbs.	Gilt	6 lbs.
8	52 "	Barrow	7 "
11	50 "	Barrow	2 "
12	64 "	Barrow	3 "
13	75 "	Barrow	8 "

TOTALS FOR 30 DAYS

Pen number	I	II	III
Average total Weight	57.80 lbs.	62.20 lbs.	54 lbs.
Average total gain	4.79 "	9.11 "	3.40 lbs.
Average daily gain	.686 "	.987 "	.467 "

The remainder of the experimental period. In addition to the supplementary feeds being fed a mineral ration was, also, given. This ration was bone-meal. It was fed the same as the supplementary feeds to all of the three groups of pigs. The pigs were now being fed twice a day for the same ration.

The final weights of the pigs were taken at the expiration of 45 days. They were as follows:

The results of the average gains made by the pigs at the end of the 30 day period, indicated that they were not gaining satisfactorily, which was probably due to the concrete floor of the pens. To alleviate this condition, the pigs were moved to another barn containing the same sized pens and equipment. Here the pigs spent the remainder of the experimental period. In addition to the supplementary feeds being fed a mineral ration was, also, given. This ration was bone meal. It was fed the same as the supplementary feeds to all of the three groups of pigs. The pigs were now being fed twice each day the same ration.

The final weights of the pigs were taken at the expiration of 45 days. They were as follows:

PEN NUMBER I

Garbage only fed

Pig number	Weight	Sex	Gain
2	56 lbs.	Barrow	4 lbs.
10	68 "	Barrow	6 "
3	52 "	Barrow	3 "
4	61 "	Barrow	5 "
7	52 "	Gilt	6 "

PEN NUMBER II

Garbage and Corn fed

Pig number	Weight	Sex	Gain
5 5	69 lbs.	Barrow	9 lbs.
6	70 "	Barrow	8 "
1	54 "	Barrow	8 "
9	58 "	Barrow	9 "
15	60 "	Barrow	9 "

PEN NUMBER III

Garbage and cotton seed meal fed

Pig number	Weight	Sex	Gain
14	64 lbs.	Gilt	4 lbs.
8	45 "	Barrow	4 "
11	48 "	Barrow	5 "
12	60 "	Barrow	6 "
13	65 "	Barrow	4 "

TOTALS FOR 45 DAY PERIOD

PENNUMBER	I (Garbage)	II (Garbage and Corn)	III (Garbage and corn (seed meal))
Average total Weight	70½ pounds	79 4/5 pounds	62½ pounds
Average total Gain	8.12 pounds	11 pounds	7.92 pounds
Average Daily gain	.81 pound	.90 pound	.48 pound

As a result of the weights for the 45 day period, it is shown that the pigs fed on garbage and corn made the highest gain, and those fed on garbage the next highest, while those on garbage and cotton seed meal gained but little. This shows that corn is a satisfactory supplement to garbage for growing and fattening pigs even in a dry lot. While cotton seed meal is not a satisfactory supplement to garbage alone. Which is indicative that it affects the weight of the pigs.

In pen number III there were two runts, pigs numbers 8 and 11. In computing the average gains they were not used.

different reasons have been advanced by scientists. Further work has, however failed to prove that the fatal effect is due to any of the causes assigned.

If cotton seed meal is not fed continuously for over 45 days and amount over one fourth of the ration, and if the pigs are freely supplied with green forage or grass as pasture, the risk is slight.

The summary weight sheet shows the individual gains of each pig and the amount of feed consumed

in the three lots over the 45 day period.

CHAPTER III

EXPERIENCE AND SCIENTIFIC TRIALS

Write in showing that cotton seed meal or cake, is not a safe feed.

Cotton seed is most poisonous to swine. Pigs getting as much as one-third of their concentrates in the form of cotton seed meal at first, but after a few weeks they become sick and may die.

During the past twenty years numerous attempts have been made to find the cause of this poisonous effect, and many different reasons have been advanced by scientist. Further work has, however failed to prove that the fatal effect is due to any of the causes assigned.

If cotton seed meal is not fed continuously for over 40 days and is not over one fourth of the ration, and if the pigs are freely supplied with green forage or graze on pasture, the risk is slight.

The summary weight sheet shows the individual gains of each pig and the amount of feed consumed

in the three lots over the 45 day period.

LOT NO.	FIG NO.	INITIAL WEIGHT	AVERAGE DAILY GAIN	FINAL WEIGHT	ROYAL GAIN
I	2	47 lbs.	.45	68 lbs.	21
I	10	35 "	.55	76 "	41
I	3	47 "	.51	61 "	14
I	4	55 "	.44	70 "	15
I	7	42 "	.55	62 "	20
II	8	53 "	.57	79 "	26
II	6	54 "	.57	80 "	26
II	1	53 "	.64	82 "	29
II	9	40 "	.67	94 "	54
II	15	44 "	.56	69 "	25
III	14	48 "	.55	70 "	22
III	8	41 "	.54	62 "	21
III	13	33 "	.53	56 "	23
III	12	48 "	.55	68 "	20
III	15	51 "	.53	75 "	24

NOTE:

- Lot number I Carriage alone fed.
- Lot number II Carriage and Corn fed.
- Lot number III Carriage and Cotton seed meal fed.

SUMMARY WEIGHT SHEET

LOT NO.	PIG NO.	INITIAL WEIGHT	AVERAGE DAILY GAIN	FINAL WEIGHT	TOTAL GAIN
I	2	47 lbs.	.48 lbs.	69 lbs.	22 lbs.
I	10	53 "	.55 "	78 "	25 "
I	3	47 "	.31 "	61 "	14 "
I	4	50 "	.44 "	70 "	20 "
I	7	40 "	.55 "	62 "	22 "
II	5	53 "	.57 "	79 "	26 "
II	6	54 "	.57 "	80 "	26 "
II	1	53 "	.64 "	62 "	29 "
II	9	40 "	.57 "	66 "	26 "
II	15	44 "	.55 "	69 "	25 "
III	14	45 "	.55 "	70 "	25 "
III	8	41 "	.24 "	52 "	11 "
III	11	38 "	.26 "	50 "	12 "
III	12	48 "	.46 "	69 "	21 "
III	13	51 "	.53 "	75 "	24 "

NOTE:

Lot number I Garbage alone fed.

Lot number II Garbage and Corn fed.

Lot number III Garbage and Cotton seed meal fed.

AVERAGE WEIGHTS AND FEED CONSUMPTION OF THE PIGS IN THE THREE LOTS

LOT NO.	INITIAL GAIN	AVERAGE DAILY GAIN	AVERAGE FINAL WEIGHT	AVERAGE TOTAL GAIN	AVERAGE AMOUNT OF FEED FOR EACH 100 POUNDS OF GAIN	CORN	COTTON SEED MEAL
I	45 lbs.	.81 lbs	72 lbs.	22 3/5 lbs.	2400 lbs.	0	0
II	54 lbs.	.94 lbs.	79 lbs.	26 2/5 lbs.	2400 lbs.	210 lbs.	0
III	46 lbs.	.80 lbs.	71 lbs.	20 3/5 lbs.	2400 lbs.	0	40 lbs.

SUMMARY of OBSERVATIONS and EXPERIMENTS

Among the points of practical application in feeding garbage supplements to swine, the following are of particular importance in the light of present knowledge on the subject.

Garbage from Prairie View Dining Hall varies greatly in composition, but allowing for normal losses it is a balanced ration.

The addition of cotton seed meal to the garbage had only a slight effect on the gain. Pigs fed on corn and garbage made the greater gains, while those on garbage alone made the next highest gains.

Fattening pigs or pigs being fed in pens do not gain well on concrete floors.

Each pig fed on garbage drank an average of one and one half gallons of water every twelve hours.

Pigs raised on garbage from weaning time will have to become accustomed to other feeds.

Pigs fed on garbage only gain an average of .686 pounds per day.

Pigs fed on garbage and corn gain an average of .987 pounds per day.

Pigs fed on garbage and cotton seed meal gain an average of .467 pounds per day.

Feeding the garbage from the Prairie View Dining Hall to the Prairie View swine herd is an economical and efficient method of garbage disposal; and makes possible the conversion of the dining hall waste into pork which can be consumed by the dining hall.

The value of garbage is sufficient to pay the cost of collection and handling.

The garbage from the Prairie View Dining Hall is exceptionally high in protein. It is composed of 15 to 18% protein.

Because of the great variation in composition of the garbage and the percentage protein, we feel it unwise to make recommendations, but from this experiment, it seems safe to say that pigs fed on garbage alone with any supplementary feed will produce the average gains. In each of three lots fed in this experiment very little variation in weight was noticeable, however, further work is being planned.

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