2-1-1908

Stock Food for Pigs

J.W. Wilson

H.G. Skinner

Bulletin 105 February, 1908

South Dakota Agricultural Experiment Station

South Dakota State College of Agriculture
and Mechanic Arts

BROOKINGS, S. DAK.

STOCK FOOD FOR PIGS

Department of Animal Husbandry

H. C. SESSIONS & SONS, PRINTERS
SIOUX FALLS, SO. DAK.

GOVERNING BOARD

REGENTS OF EDUCATION

Hon. E. C. Ericson, President ..... Elk Point, S. Dak.
Hon. F. A. Spafford ..... Flandreau, S. Dak.
Hon. A. W. Burtt ..... Huron, S. Dak.
Hon. A. J. Norby ..... Sisseton, S. Dak.
Hon. A. M. Anderson ..... Sturgis, S. D.

STATION COUNCIL

F. A. Spafford ..... Regent Member
A. J. Norby ..... Regent Member
Robert L. Slagle, President of the College
James W. Wilson, Director and Agriculturist
N. E. Hansen, Vice-Director ..... Horticulturist
James H. Shepard ..... Chemist
E. W. Olive ..... Botanist
E. L. Moore ..... Veterinarian and Zoologist
C. Larsen ..... Dairy Husbandman
R. A. Larson ..... Secretary and Accountant

ASSISTANTS

H. G. Skinner ..... Animal Husbandry
John S. Cole ..... Agronomy
A. E. Koch ..... Chemistry
Robert Matheson ..... Entomology
B. B. Lawshe ..... Stenographer

Any farmer of the State can have the Bulletins of this Station free upon application to the Director.

STOCK FOOD FOR PIGS.

JAMES W. WILSON H. G. SKINNER

The production of pork is one of the principal industries throughout the entire corn-belt. As the corn-belt is being extended northwestwardly, and as hundreds of farmers from eastern points are coming to this State, annually, to make it their future homes, the production of pork is sure to increase rapidly. There is no place in South Dakota, in which the small grains are grown, where the hog will fail to be a valuable addition to the live stock on the farm, if given a chance. The demand for pork in the market is usually as good as it is for any other kind of meat.

Early maturity is a desirable characteristic in any kind of live stock, and if this feature can be brought about by feeding artificial compounds (other than are produced on the farm) their use must be considered a benefit rather than a detriment, providing the cost is not prohibitive.

In the following pages are given the results obtained during the past two years in feeding stock foods to the fattening pig. Prepared stock foods are becoming a common commodity in our markets and wonderful claims as to their value are made in some instances when fed in conjunction with grain. Some claim that they will save feed. Prepared stock foods are to be found for sale in probably every town and city in South Dakota. Many requests have reached the writer during the past few years as to their relative feeding value, which is best, etc., etc. As it was impossible to give each food found in the market a trial, five of the commonly used brands were selected and during the summer of 1906 an experiment was planned to determine these facts. In 1907 it was repeated to ascertain whether results by feeding the same brands would be similar for the two years, thereby establishing the superiority of one brand over the others.

In addition to this an experiment was conducted, during the fall of 1907, to determine the feeding value of grain when mixed with a "home-made" preparation (which can be obtained

in any drugstore), to the feeding value of grain when mixed with a stock food. In each of these three experiments a check lot, or a lot which did not receive anything except the grain ration, was fed to make comparisons.

The results reported in Bulletin 90 of this Station, in feeding tankage and other by-products of mills and factories to pigs, show that a larger gain was made, when these products were fed, but the additional gains were produced at a greater cost than with the lot receiving nothing but the grain. However, there are by-products, such as skim milk and buttermilk, which would be considered a waste unless utilized in this manner.

The following is the report of the chemist of this Station on the analyses of the stock foods used in these experiments:

REPORT OF CHEMIST.

At the outset the chemist is confused by the conflicting claims of the manufacturers of the so-called "Stock Foods." In some places in their advertising literature they are called "foods." In other places they are called "medicines," and in other instances "condiments." Now these three terms are by no means synonymous. It seemed best therefore to submit these "foods" to the ordinary analysis which determines the feeding value of a food. In pursuance of this plan determinations were made on the usual factors, moisture, ash, ether extract, crude fibre, crude protein, nitrogen-free extract, and total nitrogen. The results are given in the following table:

TABLE A.
Analysis of Stock Foods.

BRAND	Moisture	Ash	Ether Extract	Crude Fiber	Crude Protein	N-Free Extract	Total Nitrogen
Rex	3.35	6.78	4.41	16.17	13.49	55.80	2.16
International	4.71	15.76	4 27	11.82	14.15	49.29	2.26
Clover Brand	3.57	15.82	5.94	34.34	2.63	37.70	.42
Gold Coin	4.52	20.35	9.76	21.59	12.50	31.28	2.00
Iowa	3.90	12.60	7.16	12.49	25.23	38.62	4.04

In order to make comparisons readily, the analysis of a sample of Dakota bran is subjoined: Dakota Bran: Water, 8.85; ash, 6.55; Ether extract, 5.58; crude fibre, 9.74; crude protein, 18.38; nitrogen-free extract, 50.90; total nitrogen, 2.94.

Of these constituents the crude protein is the most valuable from a feeder's standpoint since it is the most expensive and is indispensable. In this constituent the bran is by far more valuable than any of the stock foods analyzed excepting the last one on the list. The next most valuable ingredient is the nitrogen-free extract. Only two of these stock foods, the first two on the list, equal or slightly surpass the bran in this constituent.

The ether extract, consisting largely of oils and fats in common feeding stuffs, is the next constituent in value. None of the stock foods greatly excels the bran in this respect. But it must not be forgotten that in the stock foods the number representing the ether extract does not necessarily mean oils or fats. Other substances with little or no food value may be included.

The result of this comparison indicates that so far as the true feeding value of any of the stock foods examined is concerned, the bran is rather the better food. Now as to cost, it seems that the International retails at 12 cents per pound, the Clover brand at 11 cents and the others at 10 cents. Thus these foods cost the farmer respectively $240.00, $220.00 and $200.00 per ton. In this respect the bran has even at its present inflated price, $20.00 per ton, from ten to twelve times the advantage.

By comparing the analyses given in the foregoing table with those published by the Iowa Station, Bulletin 87, another grave fault appears in these so-called "foods." They are not of uniform composition. That is, they are not scientifically compounded so that a feeder who buys different lots each time gets a food of a different composition. It matters not what view point is claimed by the manufacturer, whether food, medicine or condiment, this is a grave and serious objection.

Next, let us consider these "foods" as medicines. By means of sieves, a microscope and a few chemical tests and other simple tests the most obvious constituents of these different "foods" were determined. It is not claimed that this list is given as an analysis as small and insignificant amounts of other substances might possibly be present in some of the foods. But since the list of substances is very limited which may thus be

employed, it is almost certain that the substances named are the most important ones contained by the several foods. The substances determined are as follows:

International Stock Food—Bran, weed seeds, hulls (probably coming from flour mill refuse), pepper, salt, charcoal, gentian.

Rex Brand—Bran, chaff, charcoal, fenugreek, sulphur, salt, saltpeter, gentian.

Clover Brand—Ground bark, salt, capsicum, ginger, fenugreek, sassafras, charcoal, sulphur, gentian.

Gold Coin—Mill refuse (weed seeds, wheat and flax seeds, chaff), oil meal, salt, pepper, charcoal, fenugreek, sulphur.

Iowa Brand—Oil meal, chaff, charcoal, salt, anise and other aromatics, fenugreek, sulphur.

It is probable that chaff where mentioned in all these brands occurs as an impurity in the screenings or mill refuse employed.

From the ingredients listed it will appear that none of these stock foods are powerful medicines. It seems to be the rule in making them that small proportions of the active drugs are largely diluted with inert substances, such as mill refuse, ground pine bark, linseed meal, etc. Now when one takes into consideration the fact that only a small portion is recommended at each feed, a tablespoonful or so, it immediately becomes evident that the medicinal value is nearly nil.

Of the drugs mentioned gentian is by far the best. The fenugreek, anise and aromatics are practically without value. The salt and pepper need no comment while the charcoal may be useful for intestinal disorders. But still owing to the small quantities of any drug administered, any of these stock foods would be a weak staff to rely upon in cases of sickness. Far better, safer and cheaper for the farmer would it be to call a competent veterinarian for his sick animals.

There remains to be considered the "condimental" value of these foods. As a matter of fact this question resolves itself into a question of dollars and cents. The Iowa Station has shown, Bulletin 87, that the use of these as condiments as a rule, entails a loss on the farmer who buys and feeds them. The findings of this Station emphasizes the same fact. Now, in the light of the foregoing, why is it that these foods or whatever

they may be have attained such enormous sales? It is easy to see why the manufacturer sells them. But why does the farmer buy and use them?

JAS. H. SHEPARD, *Chemist,*
South Dakota Agricultural Experiment Station.

PLAN OF THE EXPERIMENT.

During the Fall of 1906 sixty head of pigs of April and May farrow were divided into six different lots of ten head each and weighed up for the experiment. These pigs weighed between sixty and seventy pounds per head and the lots were as uniform in size and breed as as it was possible to make them. Each lot was given the run of a small field of rape and a small house eight by eight feet for shelter. The feed consisted of ground barley and corn, mixed half and half by weight, and the quantity of each stock food as per directions on package in each case. The sixth lot, or the lot that did not receive stock food, was similar in every respect to the other lots and was kept under identically the same conditions. The grain was ground so it would be in better shape to mix with the powdered stock foods. Each lot's feed was weighed, both morning and evening, before feeding, and the feed was mixed with water to prevent loss from blowing.

The following stock foods were purchased in the local market and fed according to directions: International, Rex, Clover Brand, Iowa and Gold Coin. We have no reason to believe but that these foods were standard in every respect.

For the second experiment the pigs were a trifle heavier, weighing between seventy and eighty pounds per head, but the lots were similar as to size and breed as in the first experiment. The cost of the feed is figured the same for both years in order to have a basis for comparison. The weather for the second experiment was much better for feeding than was the weather for the first experiment, hence there was a larger daily gain per head with each lot. Another factor which may have caused the larger gain of the pigs in the second experiment, was that they were fed a shorter period, the rule in feeding being that the daily gain decreases as the feeding period increases.

Again, the cost of producing a pound of gain in each case was greater during the second year than it was for the first

year. This can be accounted for from the fact that the rape pasture was better during the first year, on account of the frequent showers. In Bulletin 90 of this Station rape pasture was found to be worth seven dollars and four cents per acre for hog pasture.

PRICES OF FEEDS USED.

Corn—forty cents per bushel.
Barley—thirty-six cents per bushel.
International Stock Food—twelve cents per pound.
Clover Brand Stock Food—eleven cents per pound.
Gold Coin Stock Food—ten cents per pound.
Iowa Stock Food—ten cents per pound.
Rex Stock Food—ten cents per pound.
For grinding grain—seven cents per hundred.

Of the 114 head of pigs at the beginning only three died. Two of these were in the lot receiving Iowa Stock Food and one in the lot receiving Gold Coin Stock Food.

This lot consisted of two pure-bred Yorkshires, one pure-bred Berkshire and six grade pigs. It was fed on ground corn and barley, mixed half and half by weight for 63 days, and is used as a check lot for the ones fed stock foods and grain.

FIRST YEAR

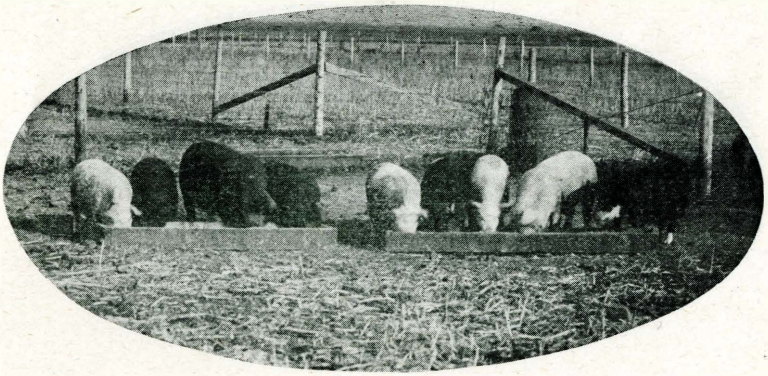
	Pounds
Average weight of the ten pigs at the beginning	69
Total quantity of food consumed in 92 days	4576
Total gain of lot	981
Feed required for 100 pounds of gain	466
Average gain per head daily	1.06
Cost of producing 100 pounds of gain	$ 3.41

SECOND YEAR

Average weight of the 9 pigs at the beginning	77
Total quantity of food consumed in 63 days	3764
Total gain of pigs	657
Feed required for 100 pounds of gain	572
Average gain per head daily	1.15
Cost of producing 100 pounds of gain	$ 4.59

SUMMARY OF BOTH YEARS

Average number of pounds of feed required for 100 pounds of gain	519
Average gain per head, daily	1.10
Average gain per head daily of all lots receiving stock foods with grain	1.17 to 1.34
Average cost of producing 100 pounds of gain with lots receiving grain alone	$ 4.00



This lot consisted of two pure-bred Yorkshires, one pure-bred Poland China, one pure-bred Berkshire, and five grade pigs. It was fed **Gold Coin Stock Food** and ground corn and barley **for 63 days.**

FIRST YEAR

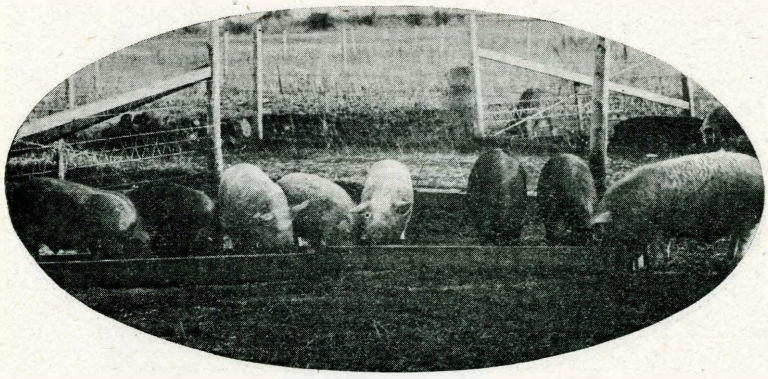
	Pounds
Average weight of the 9 pigs at the beginning	69
Total quantity of food consumed including stock food in 92 days	4295
Total gain of pigs	1026
Feed required for 100 pounds of gain	418
Average gain per head, daily	1.24
Cost of producing 100 pounds of gain	$ 3.78

SECOND YEAR

Average weight of the 9 pigs at the beginning	76
Total quantity of food consumed, including stock food in 63 days	4077
Total gain of pigs	819
Feed required for 100 pounds of gain	490
Average gain per head daily	1.44
Cost of producing 100 pounds of gain	$ 4.55

SUMMARY OF BOTH YEARS

Average number of pounds of feed required for 100 pounds of gain	454
Average number of pounds of feed required for 100 pounds of gain with lots receiving grain alone	519
Average cost of producing 100 pounds of gain	$ 4.16
Average cost of producing 100 pounds of gain with lots receiving grain alone	$ 4.00



This lot consisted of two pure-bred Yorkshires, one pure-bred Berkshire, one pure-bred Poland China and four grade pigs. It was fed Iowa Stock Food and ground corn and barley for 63 days.

FIRST YEAR

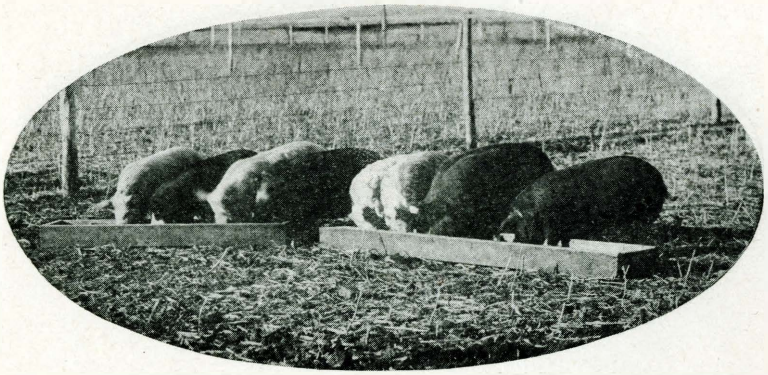
	Pounds
Average weight of the 9 pigs at the beginning	70
Total quantity of food consumed including stock food, in 92 days	4295
Total gain of pigs	982
Feed required for 100 pounds of gain	437
Average gain per head, daily	1.18
Cost of producing 100 pounds of gain	$ 3.94

SECOND YEAR

Average weight of the 8 pigs at the beginning	76
Total quantity of feed consumed, including stock food, in 63 days	3225
Total gain of pigs	640
Feed required for 100 pounds of gain	500
Average gain per head, daily	1.26
Cost of producing 100 pounds of gain	$ 4.61

SUMMARY OF BOTH YEARS

Average number of pounds of feed required for 100 pounds of gain	468
Average number of pounds of feed required to produce 100 pounds of gain with lots receiving grain alone.	519
Average cost of producing 100 pounds of gain	$ 4.27
Average cost of producing 100 pounds of gain with lots receiving grain alone	$ 4.00



This lot consisted of two pure-bred Yorkshires, two pure-bred Poland Chinas, one pure-bred Berkshire and four grade pigs. It was fed Clover Brand Stock Food and ground corn and barley for 63 days.

FIRST YEAR

	Pounds
Average weight of the 10 pigs at the beginning	70
Total quantity of food consumed, including stock food, in 92 days	4693
Total gain of pigs	1070
Feed required for 100 pounds of gain	438
Average gain per head, daily	1.16
Cost of producing 100 pounds of gain	$ 4.01

SECOND YEAR

Average weight of the 9 pigs at the beginning	79
Total quantity of food consumed, including stock food in 63 days	4042
Total gain of pigs	775
Feed required for 100 pounds of gain	534
Average gain per head, daily	1.36
Cost of producing 100 pounds of gain	$ 4.84

SUMMARY OF BOTH YEARS

Average number of pounds of feed required for 100 pounds of gain	486
Average number of pounds of feed required for 100 pounds of gain with lots receiving grain alone	519
Average cost of producing 100 pounds of gain	$ 4.42
Average cost of producing 100 pounds of gain with lots receiving grain alone	$ 4.00

This lot consisted of two pure-bred Berkshires, one pure-bred Poland China and six grade pigs. It was fed Rex Stock Food and ground corn and barley for 63 days.

FIRST YEAR

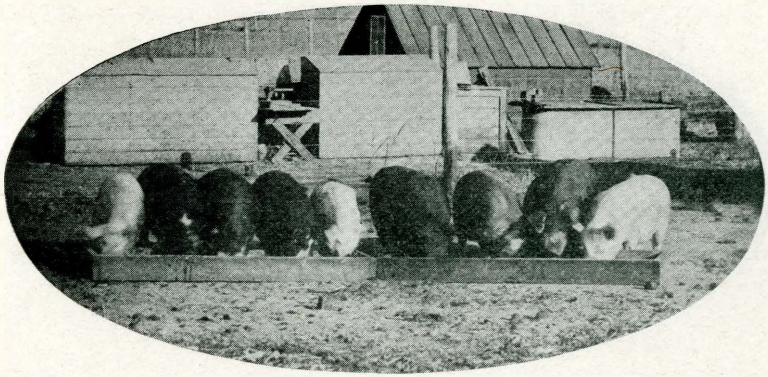
	Pounds
Average weight of the 10 pigs at the beginning	69
Total quantity of food consumed including stock food, in 92 days	4693
Feed required for 100 pounds of gain	453
Total gain of pigs	1034
Average gain per head, daily	1.12
Cost of producing 100 pounds of gain	$ 4.10

SECOND YEAR

Average weight of the 9 pigs at the beginning	75
Total quantity of food consumed, including stock food in 63 days	3854
Total gain of pigs	772
Feed required for 100 pounds of gain	499
Average gain per head, daily	1.22
Cost of producing 100 pounds of gain	$ 4.57

SUMMARY OF BOTH YEARS

Average number of pounds of feed required for 100 pounds of grain	476
Average number of pounds of feed required for 100 pounds of gain with lots receiving grain alone	519
Average cost of producing 100 pounds of gain	$ 4.33
Average cost of producing 100 pounds of gain with lots receiving grain alone	$ 4.00



This lot consisted of two pure-bred Yorkshires, one pure-bred Berkshire, one pure-bred Poland China and five grade pigs. It was fed on International Stock Food and ground corn and barley for 63 days.

FIRST YEAR

	Pounds
Average weight of the 10 pigs at the beginning	70
Total quantity of food consumed, including stock food, in 92 days	4693
Total gain of pigs	1059
Feed required for 100 pounds of gain	443
Average gain per head, daily	1.15
Cost of producing 100 pounds of gain	$ 4.37

SECOND YEAR

Average weight of the 9 pigs at the beginning	77
Total quantity of food consumed, including stock food, in 63 days	4020
Total gain of pigs	819
Feed required for 100 pounds of gain	490
Average gain per head, daily	1.44
Cost of producing 100 pounds of gain	$ 4.79

SUMMARY OF BOTH YEARS

Average number of pounds of feed required for 100 pounds of gain	466
Average number of pounds of feed required for 100 pounds of gain with lots receiving grain alone	519
Average cost of producing 100 pounds of gain	$ 4.58
Average cost of producing 100 pounds of gain with lots ceiving grain alone	$ 4.00

From the preceding records it will be noticed that the average cost of producing one hundred pounds of gain is not excessive, but larger in each case than for the average of the lots that received no stock food.

It is also true that it required more pounds of feed to produce a pound of gain with the two lots fed grain only than it did with the ten lots fed both stock food and grain. The following table shows the average of both feeding tests for the twelve different lots:

TABLE B.

Kind of Stock Food Fed With Grain	Average Weight at Beginning	Average Weight At End	Average Gain Per Head	Average Gain Per Head Daily	Average Feed for 100 Lbs. Gain	Average Cost of Producing 100 Lbs. of Gain
Grain Alone.....	73	159	85	1.10	519	$4.00
Gold Coin and Grain.....	72	175	102	1.34	454	$4.16
Iowa and Grain.....	73	168	94	1.22	468	$4.27
Clover Brand and Grain.....	74	171	96	1.26	486	$4.42
Rex and Grain.....	72	167	94	1.17	476	$4.33
International and Grain.....	73	172	98	1.29	466	$4.58

From the above table we find that the lots fed on Gold Coin stock food made 100 pounds of gain with the least average number of pounds of feed. Turning back to Table A we notice that this stock food contained 4.53 per cent more ash than did any of the other stock foods. It also contained 2.6 per cent more ether extract or fat than did any of the other stock foods. It also contained 6.42 per cent. less nitrogen-free extract.

In the report of the Iowa State Board of Agriculture for 1906 on the adulterations of foods, etc., the Gold Coin stock food was found to contain oats, hulls, cereal, common salt, pepper and sulphur, and it was diluted with bran and mill offal. The report further states that it contains 13.11 per cent of protein. By Table A it may be seen that the Iowa stock food contains nearly double the per cent of protein of any of the others used, but the average gain for the two lots fed on Iowa stock food was not as large as for the gain of the two lots fed on Gold

Coin and International stock food, where there was a little more than one-half the protein fed.

It required more pounds of grain to make a pound of gain when the Clover Brand stock food was fed than it did with any of the other lots receiving stock food. From Table A we find that this food contains 12.75 per cent more crude fibre than any other stock food analyzed. Crude fibre consists of cellulose or the fibrous part of the plant and as a rule is not highly digestible. In the report of the Iowa State Department of Agriculture for 1906 on the Adulterations of Foods, we find that the Iowa stock food consists of linseed meal, chaff, charcoal, and aromatic substances. This high per cent of crude fibre probably comes from the chaff, and the per cent of crude protein from the Linseed meal. As the stomach of the pig is comparatively small, a bulky food is not required, but on the other hand it should be concentrated.

I quote from the above mentioned report as to the probable ingredients of each of the stock foods used in this experiment:

Clover Brand—Evident dilutent, Pine bark; common salt, fenugreek, ginger, charcoal, sulphur, gentian, capsicum, sassafras.

Gold Coin—Evident dilutent, Bran and mill offal; common salt, pepper, sulphur, cereal, oat hulls.

International—Evident dilutent, Bran and mill offal; common salt, plant tissue, pepper, charcoal, gentian, seeds, chaff and hulls.

Iowa—Evident dilutent, Linseed meal; charcoal, aromatic substances, chaff.

Rex—Evident dilutent, Wheat feed; common salt, fenugreek, charcoal, wheat kernels, hominy.

By comparing the report of the chemist of this Station, which will be found on a preceding page, as to the probable ingredients of each stock food fed with the above report, it will be noticed that they are not the same for the same brand.

SECOND EXPERIMENT.

The object of this experiment was to ascertain the relative feeding value of a home-made stock food to a commercial stock food. The International stock food was selected for this purpose. The home-made stock food can be made by any one, and

from the results of this experiment it is a much cheaper food than any other used. It contains those ingredients which tend to increase the appetite and thereby cause a larger consumption of grain and a quicker gain.

THE EXPERIMENT.

Twenty-four head of pigs farrowed in May, 1907, were divided into three different lots of eight head each and weighed up for the experiment. With the exception of three head they were all pure-bred Poland Chinas, bred and raised on the College Farm. These pigs were a trifle younger but the lots were nearer the same age, size and weight than those used in the two previous experiments. These lots had the run of a blue grass pasture and were fed all the feed they would eat both morning and evening. The check lot in this case received ground corn, and the other two lots ground corn and stock foods.

In figuring the cost of producing a pound of gain in each lot, the corn was figured at 40 cents per bushel, the International stock food at 12 cents per pound, the home made stock food at 4½ cents per pound, and 7 cents per hundred for grinding corn, the same prices as for the preceding experiment.

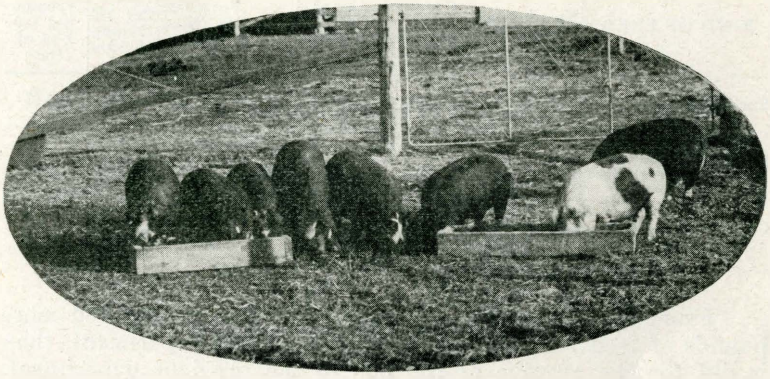
TABLE C.

KIND OF FEED	No of Pigs	Days Fed	Weight at Beginning	Weight at End	Gain	Pounds of Feed Fed Including Stock Food	Feed Per 100 Pounds of Gain	Cost of Producing 100 Lbs. of Gain
Corn Meal.....	8	61	699	1,213	514	2,528	491	$3.85
Corn Meal and International Stock Food	8	61	698	1,181	483	2,656	549	$4.69
Corn Meal and Home Made Stock Food..	8	61	698	1,249	551	2,817	511	$4.40

From the above table it will be seen that it required more pounds of feed for 100 pounds of gain in this experiment, than it did for the average of the lots in the previous experiment. This can be accounted for from the fact that the rape pasture furnished a more succulent feed than did the blue grass pasture.

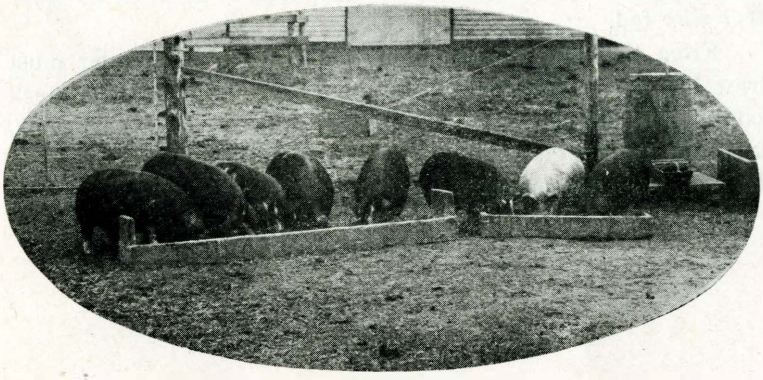
This lot consisted of seven pure-bred Poland China pigs and one grade pig. It was fed on ground corn for 61 days to serve as a check lot for the other two lots in this experiment fed on same kind of a grain ration with the addition of International and home-made stock foods.

	Pounds.
Average weight of the 8 pigs at the beginning	87
Total quantity of ground corn consumed, in 61 days.	2528
Total gain of pigs	514
Feed required for 100 pounds of gain	491
Average gain per head daily	1.05
Cost of producing 100 pounds of gain	$ 3.85



This lot consisted of seven pure-bred Poland China pigs and one grade pig. It was fed on International stock food and ground corn for 61 days.

	Pounds.
Average weight of the 8 pigs at the beginning	87
Total quantity of food consumed, including stock food in 61 days	2656
Total gain of pigs	483
Feed required for 100 pounds of gain	549
Average gain per head daily	.99
Average gain per head daily of lot receiving ground corn alone	1.05
Cost of producing 100 pounds of gain	$ 4.69
Cost of producing 100 pounds of gain with lot that received grain alone	$ 3.85



This lot consisted of seven pure-bred Poland China pigs and one grade pig. It was fed on a home-made stock food and ground corn for 61 days.

	Pounds.
Average weight of the 8 pigs at the beginning	87
Total quantity of food consumed, including stock food in 61 days	2817
Total gain of pigs	551
Feed required for 100 pounds of gain	511
Average gain per head daily	1.12
Average gain per head daily of lot receiving ground corn alone	1.05
Cost of producing 100 pounds of gain	$ 4.40
Cost of producing 100 pounds of gain with lot receiving corn alone	$ 3.85

HOME-MADE STOCK FOOD.

The Veterinarian, E. L. Moore, and the Chemist, J. H. Shepard, of this Station, suggested the formula for a home-made stock food:

"Gentian, two pounds, cost $ .50; Ginger, one pound, cost $ .40; Sodium Bicarbonate, one pound, cost $ .10; Fenugreek, one-half pound, cost $ .10.

"Purchase these materials at a drugstore and have them mixed into fine powders. Then, mix with five pounds of common salt and twenty-five pounds of shorts. This compound will cost about 4½ cents per pound. For the pig, mix one pound with every 48 pounds of grain."

This furnishes a comparatively cheap stock food, but even this preparation did not make as cheap a gain as when no stock food was fed.

From the data presented in this bulletin the reader must draw his own conclusions as to the value of any of the stock foods tried. There were 135 pigs, all told, in the experiments. Each pig made a good gain and was in good salable condition at the end of the experiments.