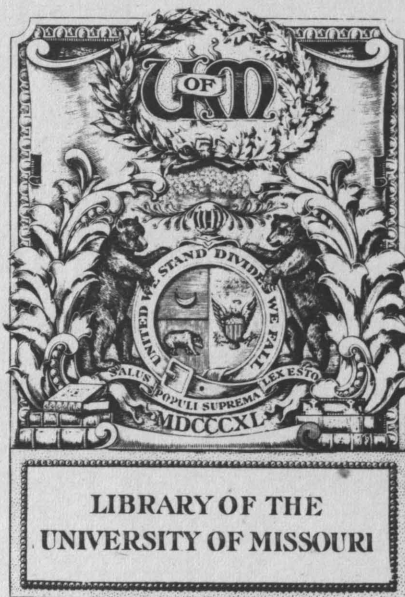


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A THESIS.

FOOD NUTRIENTS REQUIRED FOR MAINTENANCE OF
BROOD SOWS AND FOR GROWTH OF PIGS TO
WEANING TIME.

BY

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PRESENTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

AGRICULTURE.

COLLEGE OF AGRICULTURE
UNIVERSITY OF MISSOURI.

MAY, 1910.

DEPARTMENT OF ANIMAL HUSBANDRY

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378.7M71
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MAINTENANCE OF BROOD SOWS AND COST OF PIGS
TO WEANING TIME.

A great many experiments have been carried on with swine, which have determined the amount of feed necessary and the cost to produce a pound of gain during periods of fattening, with various kinds and combinations of foodstuffs; but there is a decided lack of knowledge regarding the cost of maintaining the brood sow throughout the year and the cost of producing the pig to weaning time. Such lack of data has helped to retard the placement of Agriculture upon a business basis. There have been no data available by which a charge could be made against the "feeder hog" at time of weaning. Such factors along with the difficulty of division of labor have prevented the farmer from applying business principles to his profession; and the lack of application of business principles to farming has resulted in depressing the net profits that might accrue from the profession.

From November 18, 1908 to March 2, 1910 - a period of 469 days - the following experiment was conducted with the hope of furnishing to the feeder and others interested material from which the real cost of the pig at weaning time could be ascertained. The object was to collect such data as would warrant the debiting of the pig at weaning time with certain charges. In order to do this it was necessary to determine the cost of maintenance of the brood sow throughout the year, including the cost of maintenance while farrow and suckling pigs.



Fig. 4 Hog lots. Showing where the sows were kept at the beginning of the experiment.

GENERAL PLAN OF EXPERIMENT.

The sows used in this experiment were kept as nearly as possible on a maintenance ration throughout the experiment, except during the period of gestation when they were allowed an increase of twenty-five pounds* in order to provide for the growth of the foetae and foetal envelopes without expense to the sow's maintenance weight. After the sow recovered from parturition, an attempt was made to keep her at maintenance weight while suckling the pigs. As soon as the pigs expressed a desire to eat out of the trough they were provided with a small pen in one corner of the lot where they were fed. Sow and pigs were fed at the same time to make certain that they ate only their own ration.

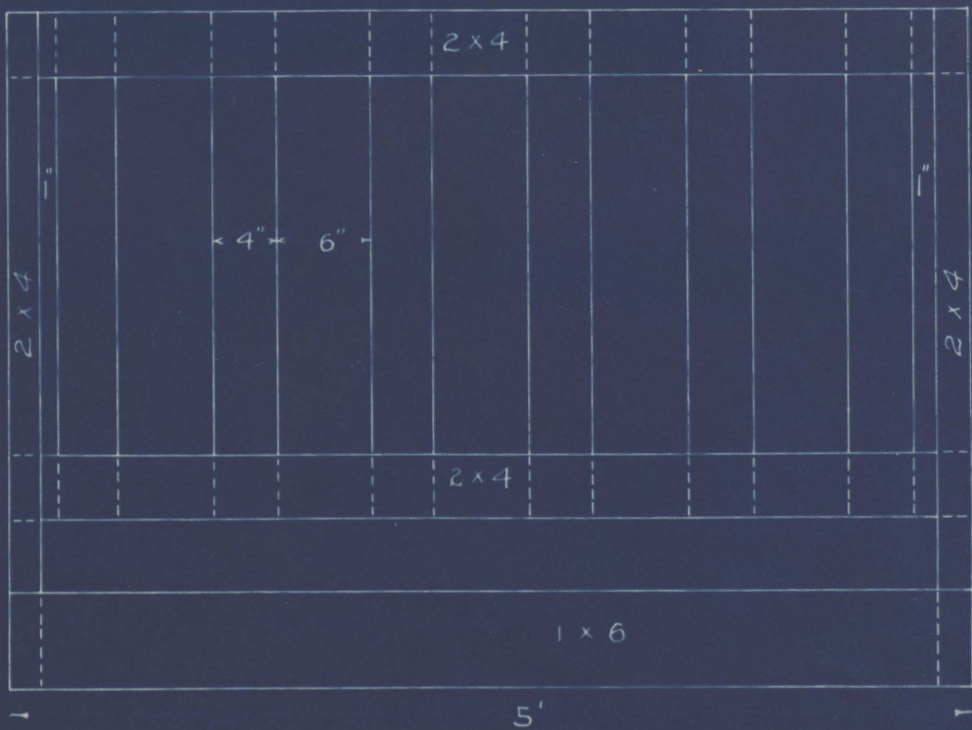
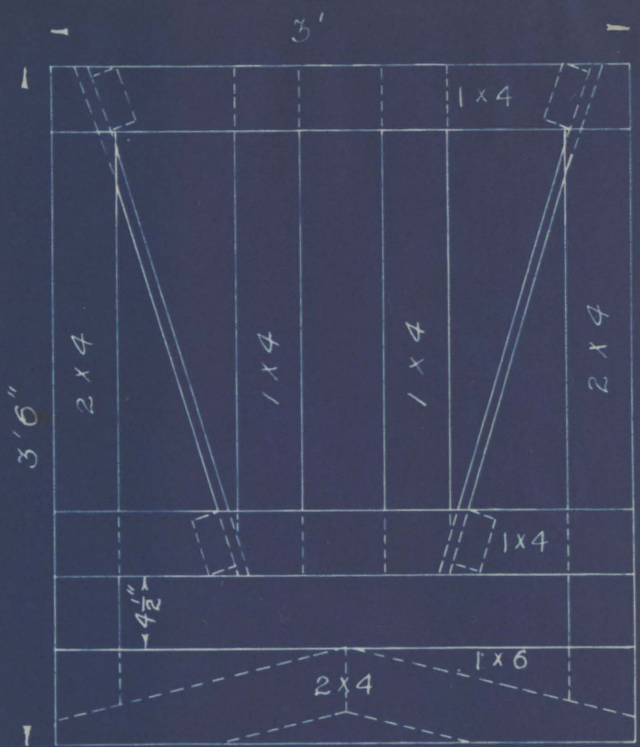
RATIONS.

In order to lessen the amount of error that would arise through the limitations of any one ration the sows were divided into four lots of two sows each, and fed four kinds of rations. It was also desired to determine the relative efficiency of each ration for maintenance purposes.

Lot I received corn meal two parts, bran one part, and clover hay ad libitum, except from May 20 to September 2 inclusive, when bluegrass was given ad libitum.

Lot II received corn two parts, shorts one part and clover hay ad libitum, ^{except} from May 20 to September 2, inclusive, when bluegrass was given ad libitum!

*Based upon data from Wis. Exp.Sta. Bull.I07,p 7.



MISSOURI EXPERIMENT STATION HOG RACK FOR FEEDING ROUGHNESS

Fig. 2.

Lot III received cornmeal eleven parts, tankage one part and clover hay ad libitum, except from May 20 to September 2 inclusive, when bluegrass was given ad libitum.

Lot IV received corn meal nine parts, linseedmeal one part, and clover hay ad libitum, except from May 20 to September 2 inclusive, when bluegrass was given ad libitum.

METHOD OF FEEDING.

The sows while dry were fed grain but once per day. Hay was given in the morning, and the grain ration at 5 P.M. The hay was fed fresh each day in racks especially designed for hogs (see fig. 2, pg. 7-) and in such quantities as to keep some ever before the animals. The aim was to feed enough hay so that there should be from one to two pounds refuse from each day's feeding. The racks were cleaned out in the morning, the refuse weighed, and fresh hay weighed and put in. The grain ration was weighed on an accurate platform spring scale at each feeding time and fed in the proportions outlined, in the form of a slop. The amount of grain fed was regulated by the weight of the sow at each weighing period. If the sow was above the maintenance weight* the feed was reduced or if below the maintenance weight the grain ration was increased. This rule was adhered to except during the period of gestation when the sow was allowed to increase her maintenance weight by twenty-five pounds so that the foetals could be produced without expense to the normal body weight. After farrowing the grain ration was fed twice daily, and an attempt was made to keep the

*The initial weight of the experiment was taken as the maintenance weight.

sows at maintenance weight by increasing the grain ration. However, a full ration could not be given for two or three weeks after farrowing, owing to the fact that the pigs would become too laxative, through sudden changes in the sow's diet. Although in most cases the sow at the third week from farrowing was taking a full grain ration, yet it was found almost impossible to keep her at maintenance weight. The sows did, however, regain their maintenance weight by weaning time, in every case except sows No. I and No. I4 at the weaning time of their second litter. As soon as the pigs showed a desire to eat grain from the sow's trough they were penned off in one corner of the lot while the sow ate her grain ration, and were given a grain ration of two parts shorts, two parts bran and one part oilmeal. As soon as the pigs were weaned and the sow was at maintenance, the grain ration was again regulated so as to keep the sow at maintenance.

From May 20 to September 2 inclusive, bluegrass was substituted for clover hay. The bluegrass was cut fresh each morning from pasture fields of bluegrass, and fed fresh. A small amount was at the same time placed in an empty pen and weighed the following morning, in order to determine the amount of moisture that had been lost by the bluegrass. This being known the original weight of the bluegrass not eaten could be determined.

KINDS OF FEED.

The cornmeal and supplements used were such as



Fig. 2 Exterior view of Hog Barn where the
Experiment was conducted.

could be obtained on the market and were, so far as could be judged, of average quality throughout the experiment. The tankage used was Swift's 60 per cent protein tankage. The oilmeal was purchased for old process meal.

The clover hay used was the best that could be obtained from time to time from the surrounding country, but was on the average what would be classed as fair to medium. Could a better quality of hay ^{have} been obtained, undoubtedly the amount of grain required would have been less.

It is to be regretted that analyses of foodstuffs and digestive trials could not have been made in connection with these experiments. In the absence of such trials the digestible nutrients were calculated from the average analyses given in Henry's "Feeds and Feeding", table III in the appendix. The digestible nutrients for each foodstuff is given on page 10.

TABLE OF DIGESTIBLE NUTRIENTS.

Name of Feed	Dry Matter in 100#	Digestible Nutrients in 100 pounds.		
		Protein	Carbohydrates	Ether Extract
Corn all Analyses	89.1	7.9	66.7	4.3
Wheat Bran	88.1	12.2	39.2	2.7
Wheat Middlings	87.9	12.8	53.0	3.4
Linseed Meal	90.8	29.3	32.7	7.0
Tankage*		55.2		7.1
Red Clover Hay (Medium)	84.7	6.8	35.8	1.7
Blue grass (fresh)	34.9	3.0	19.8	0.8

* Calculated from digestion coefficients given in Jordan's "The Feeding of Animals."



Fig. 4. Interior view of hog barn, showing
Arrangement of feed racks and feed troughs.

PLACE OF CARRYING ON EXPERIMENT.

When the experiment began (November 18, 1908) the sows were kept in outdoor lots, 30 ft. X 100 ft. with two sows in each lot. (See fig./ pg. 5) One cot for sleeping quarters was used for each lot, the hay was fed in racks outside, and the grain ration in troughs. But owing to the difficulty in securing accurate weights of the refuse hay and the tendency of one sow of each lot to secure more than her share of the grain ration, each sow was moved to the hog barn in January, and assigned separate pens. (See figs. 3^{and 4} pg. 10^{and 11}) Each pen in the hog barn is floored with cement and is provided with a dry lot 10 ft. X 30 ft. The racks were placed inside so that the refuse at all times would be air dry.

WEIGHING OF SOWS.

The sows were weighed in the afternoon of each Wednesday of each week, and record made of the same. If the weight was slightly above or below the maintenance weight the grain ration was continued as for the previous week, otherwise the ration was increased or decreased according as the weight was above or below maintenance.

METHOD OF KEEPING RECORDS.

The feed was weighed at each feeding time and recorded. Records were made daily on 3 in. X 5 in. perforated pads which were torn off at each weighday and pasted in a book of permanent record in the office. These sheets constitute the original records from which all data was derived.



Fig. 5 Sow No. II.

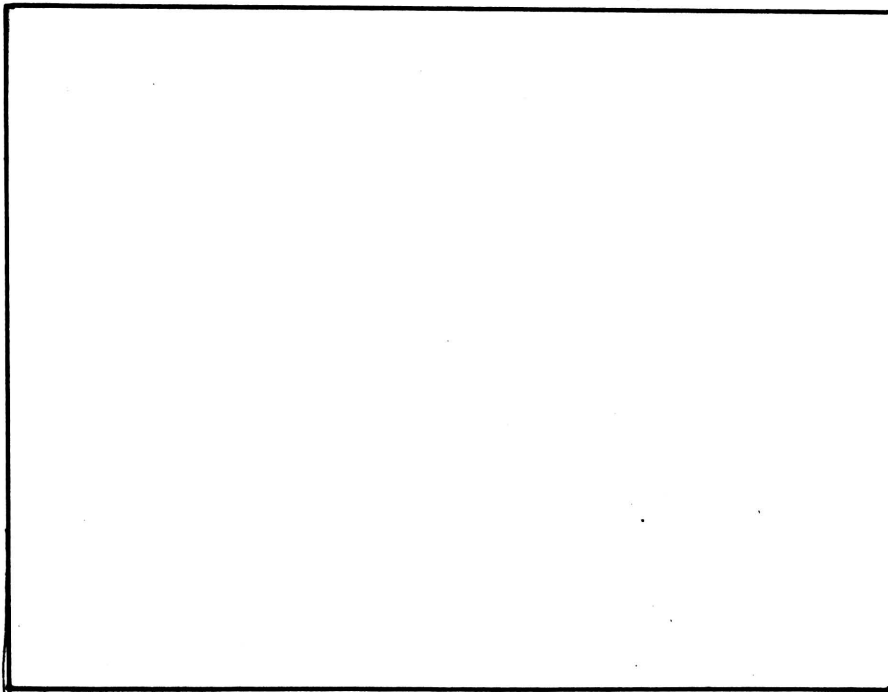


Fig. 6 Sow No. I3.

Lot. I Sows fed corn, bran and clover hay ration.

DESCRIPTION OF ANIMALS USED.

Owing to the differences that might be thought to exist between breeds, the animals used in this experiment were all of one breed, namely, Poland China. Purebred Poland China gilts ranging from eighteen to twenty months of age were used. These gilts had been well fed the previous winter and had been pastured upon bluegrass throughout the summer, supplemented with a little corn, and were in good condition at the beginning of the experiment.

SOWS OF LOT I. (see figs. ^{no 6} pg. 13)

Sow No. II was farrowed March 10, 1907, with a litter of six, and was twenty months old at the beginning of the experiment. She was of excellent build, having heavy hams, extra good length and fair depth. The breeding of Sow No. II was as follows:-

Sire,- Stylish Perfection 29205-	{	Chief Perfection 2nd. 21701 Hulda's Style (64378)
Dam,- Miss Success (101604)	{	Perfect Success 30456 Miss Rose (76497)

Sow No. 13 was of the same breeding as Sow No II, was farrowed in the same litter, and was of very much the same type.

SOWS OF LOT II. (See figs. ^{no 8} pg 17)

Sow No. 20 was farrowed March 10, 1907 with a litter of six and at the beginning of the experiment was nineteen months old. She was of medium length, deep bodied, and had fair hams and medium spring of rib. The breeding of No. 20 was as follows:-



Fig. 7 Sow No. 14.



Fig. 8 Sow No. 20.

Lot II Sows fed corn, shorts and clover hay ration.

Sire	Successful-44039	{	Imperial Chief 42295
			Miss Success (101604)
Dam	Marigold (102278)	{	Mo's Keep On 37430
			Creole Belle (88503)

SOW NO. 14.

This sow was of the same breeding as sows Nos. II and I3, was farrowed in the same litter, and was very much the same type.

SOWS OF LOT III. (See figs ^{and 10} pg 17.)

Sow No. 3I was farrowed May 29, 1907 with a litter of five, and at the beginning of the experiment was 18 months old. This sow had good medium length, good depth, and fair length of rib. The breeding of sow No. 3I was as follows:-

Sire	Successful 44039	{	Imperial Chief 42295
			Miss Success (101604)
Dam.	Cleopatra (98786)	{	Corrector 2d 37918
			Quick Step (92378)

Sow No. I was farrowed May 7, 1907 with a litter of seven and at the beginning of the experiment was one year, six month, and eleven days old. She was a long bodied sow with medium length of leg, well sprung rib, and had a fair ham.

The breeding of Sow No. I was as follows:-

Sire	Successful 44039	{	Imperial Chief 42295
			Miss Success (101604)
Dam	Verbena (102279)	{	Miss Keep On 37430
			Creole Belle (88503)



Fig. 9 Sow No. I.



Fig. 10 Sow No. 31.

Lot III Sows fed corn, tankage and clover hay ration.

SOWS OF LOT IV. (See figs. ^{11 and 12} pg. 20.)

Sow No. 30 was farrowed May 29, 1907, with a litter of five, and at the beginning of the experiment was one year, five months, and twenty days old.

This sow was characterized by having good depth, medium length of limb, fair spring of rib, and good hams.

Her breeding was as follows:-

Sire	{	Imperial Chief 42295
Successful		Miss Success (IOI604)
44039		
Dam	{	Corrector 2d. 37918
Cleopatra		Quick Step (92378)
(98786)		

Sow No. 2 was farrowed May 26, 1907, with a litter of three, and was consequently one year, five months, and twenty-three days old at the time of the beginning of the experiment.

This sow was medium to short in length, of fair depth, and had good quality of bone and hair.

Her breeding was as follows:-

Sire	{	Imperial Chief 42295
Successful		Miss Success (IOI604)
44039		
Dam	{	Chief Eclipsed 22499
Creole Belle		Tecumseh Hadley (58355)
(88503)		

A study of the pedigrees will show that the sows used in this experiment were of very much the same breeding. Sows number II, I3 and I4 were litter sisters, and their dam was also the dam of the sire of the remaining sows. Number 3I and 30 were litter sisters; and numbers 20 and I



Fig. 11 Sow No. 2.

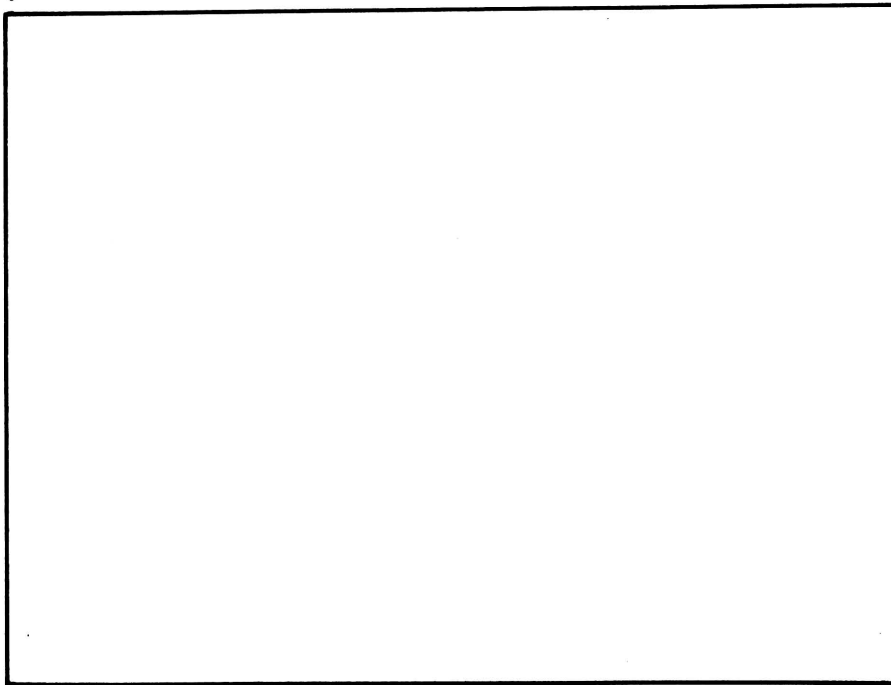


Fig. 12 Sow No. 30.

Lot IV. Sow fed corn, oilmeal and clover hay ration.

were of practically the same breeding since they were by the same boar and their dams were litter sisters. The dam of number 2 was also the grand dam of numbers 20 and I. Their pedigrees show them to be of uniform breeding.

The sows were also quite uniform in size and general characteristics. Each sow possessed good quality as was evidenced by the quality of bone, hair and skin, and each was of good build. Sows numbers 20, 31, 30, I and 2 were characterized by a fair spring of rib, medium length, and good depth. Sows number II, I3 and I4 possessed a little more length and spring of rib. From general appearances all the sows would be classed as of more than average desirability as purebred Poland China breeding sows.

RECORDS OF SOWS.

In the appendix is given a complete weekly record of the weights of the sows, also of the feed given, and the total digestible nutrients consumed by each sow. Accompanying each record is a chart showing in curves the grain consumed, the grain consumed, the hay or grass consumed, the total digestible nutrients in the food eaten, and the weight of the sow, from week to week

The general health of the sows on this experiment, so far as could be judged by the appetite and feces, was excellent, ^{except} during the spring of 1909. Cholera was in the herd at this time, and although every animal was inoculated with antitoxic cholera serum at the first appearance of the disease, yet two sows died of the disease, Several were so sick as to

refuse all feed, and the remaining sows may have been effected although they did not refuse feed. Sow number I3 of lot I, died of cholera May 3, 1909. Sow number II of lot I refused feed May 14 to 20 inclusive; sow number I4 of lot II, Apr. 12 to 22 inclusive; and sow number I of lot III, May 14 to 20 inclusive. Days when sows refused feed were not used in calculating data. All sows were bred to produce litters in the spring and fall,- two litters per year, although sows numbers II, 20, 3I and 2 failed to produce litters during the fall of 1909. Every sow, except sow number II produced a litter during the spring of 1909. Sow number II proved a non-breeder until after the close of this experiment.

In the calculation of the tables which follow in this paper where comparisons are made between the hay consumed and grain consumed, the grass which was fed from May 20 to September 2 was interputed into its equivalent in hay so that the consumption of roughage for summer and winter could be compared. From data given in Henry's "Feeds and Feeding", 100 pounds of grass was calculated as the equivalent of 44.29 pounds of hay.

PRICES OF FEEDS.

The prices charged for the grain and hay used in this experiment were as follows:-

Corn.....	\$0.56 per bu.
Shorts.....	22.50 " ton.

Bran.....\$22.50 per ton.
Oilmeal..... 30.00 " "
Tankage..... 40.00
Clover Hay..... 10.00

These prices represent the average prevailing market prices of the feeds used. The prices are also high enough to give a conservative estimate of the cost of maintenance of sows and the production of pigs to weaning time, under present conditions.

TOTAL DIGESTIBLE NUTRIENTS REQUIRED FOR MAINTENANCE OF SOWS WHILE DRY.

The average amount of total digestible nutrients required for cattle, horses, and sheep has been well worked out by a comparatively large number of experiments; but there are little available data on the maintenance requirements for swine. The maintenance requirement for cattle was determined by Kühn by elaborate experiments from the years 1882 to 1890. His experiments justify the conclusion that the average quantity of digestible organic matter which will maintain a 1000 pound mature ox at rest is 7.3 pounds, .7 pounds of which should be protein. Zuntz who has so thoroughly studied the nutrition of the horse, concludes, after a critical study of the results of other men in connection with the elaborate data from his own extended investigations, that a 1000 pound horse can be maintained on 6.4 pounds of nutrients, provided the total ration contains not more than three pounds of crude fiber. Wolff's latest conclusion was that a 1000 pound horse should have 6.78 pounds of digestible organic matter daily, (fiber, The total amount, of digestible nutrients, exclusive of the digested crude fiber, required by cattle and horses for maintenance purposes does not, then, differ materially. For cattle the required amount is 7.3; and for horses, 6.4 to 6.78. But how about swine? Do brood sows maintain themselves at a lesser or a greater expenditure of energy than do cattle or horses? The food requirements for brood sows as given by Wolff are as follows:-

	Dry matter lbs.	Digestible organic substances.				Nutritional Ratio
		Protein lbs.	Carbo-hydrate lbs.	Fat lbs.	Total lbs.	
Feeding standard for Brood sows per 1000 lbs. live weight daily	22	2.5	15.5	.4	18.4	6.6

It is not stated whether or not the requirements are for sows which are suckling pigs or for sows which are dry, although it is hardly probable that the requirements of non-suckling brood sows are from two to three times that for cattle or horses. With a view to determining the total nutrients required for maintenance of non-suckling brood sows the following data has been compiled from this experiment,-

(See pg. 27 for Table of "Digestible nutrients required to Maintain a Sow While not Suckling Pigs").

The average number of days that the sows were not suckling pigs was 309.3 days, and the average number of pounds of digestible nutrients required for maintenance per 1000 pounds live weight during this time for all the sows on experiment was 8.41 pounds. The total food nutrients required for the maintenance of non-suckling brood sows exceeded that required by cattle and horses by from 5.59 to 24.10 per cent. With the ration of 11 part corn, 1 part tankage, and clover hay ad libitum, there was required but 5.59 per cent more than is required for cattle.

The greater amount of food nutrients required by swine for maintenance as compared with cattle or horses is not because swine make a less efficient use of

DIGESTIBLE NUTRIENTS REQUIRED TO MAINTAIN A
SOW WHILE NOT SUCKLING PIGS.

No. of Sows	Ration	Average Weight of Sows	Number of Days	Average Total Digestible Nutrients eaten per head per day	Average Total Digestible Nutrients eaten per head per day for each ration	Average Total Nutrients eaten per Cwt. per Day	Average Total Nutrients eaten per Cwt. per day for each Ration.
		lbs.	days	lbs.	lbs.	lbs.	lbs.
31	11 Corn and Tankage	283.1	382	2.192		.774	
1	11 Corn and Tankage	280.8	292	2.206	2.199	.785	.779
2	9 Corn and 1 Oilmeal	256.9	371	2.114		.823	
30	9 Corn and 1 Oilmeal	281.5	56	2.395	2.254	.850	.836
20	2 Corn and 1 Shorts	239.5	372	2.515		1.050	
14	2 Corn and 1 Shorts	327.2	378	2.521	2.518	.771	.910
11	2 Corn and 1 Bran	286.8	469	2.557		.891	
13	2 Corn and 1 Bran	315.0	155	2.392	2.474	.759	.825
AVERAGES		284.8	309.3	2,376		.841	

food nutrients but because of the greater exposed surface* per unit of weight in swine. The fine furry coat which cattle and horses possess during the winter affords them a natural protection from cold which swine do not possess. The protection from cold which swine possess is not in the hair but in the very thick covering of subcutaneous fat which the hog so easily stores up in the fall from such food as nuts and tubers. It is not improbable, however, that a thick subcutaneous covering of fat on the hog may even serve as a greater protection against the radiation of heat than does the furry covering of cattle and horses. In this experiment the maintenance requirement of the heavier, fatter animal of each lot was lower, with the exception of sow No. 30 of lot No. 4. The high maintenance of sow No. 30 may, however, have been due to the fact that the entire data for this sow was collected only for winter months.

The greater maintenance requirement of swine as compared with cattle and horses may be due to the greater radiating body surface per unit of weight. The following table shows that the radiation of energy from horses, swine, men and dogs is nearly the same per unit area, as computed by Zuntz and Hagemann;

*American Text Book of Physiology vol. I, pp 482, 483.

† Table from Armsby's Animal Nutrition p 369.

	Average Temperature Deg.C.	Average weight Kgs.	FASTING METABOLISM.	
			Per Kg. Cals.	Per Square Meter, Cals
Horse.....	9.1 (?)	441	11.3	>948
Swine.....	20.1	128	19.1	1078
Man.....	14.3	64.3	32.1	1042
Dog.....	18.0	15.2	51.5	1039
Rabbit.....	18.2	2.3	75.1	776
Goose.....	15.0	3.5	66.7	967
Hen.....	18.5	2.0	71.0	943

The table shows that per unit of area the heat production is practically the same, but per unit weight the heat production increases as the body weight decreases. The ratio between the heat production in fasting metabolism- which is comparable with maintenance requirements- of horses and swine is as 1:1.69.

The ratio between the total food nutrients of horses on maintenance and the food nutrients required for maintenance by the sows in this experiment was as 1:1.23. According to v. Hösslin,* "all the important physiological activities of the body, including, of course, its internal work and the consequent heat production, are substantially proportional to the two-thirds power of its volume (or weight), and that since the external surface bears the same ^{relation} ~~ratio~~ to the volume, a proportionality necessarily exists between heat production and surface". We may conclude then that the greater maintenance of the sows as compared with larger domestic animals is due to the larger exposed surface per unit weight.

*Arch. f. (Anat. u.) Physiol. 1888, p. 323.

The rations fed seemed also to have had specific effects upon the food nutrients required for maintenance. In economy of food nutrients required for maintenance the rations rank as follows, first corn and tankage ration, second corn and bran, third corn and oilmeal, and fourth corn and shorts. The most likely explanation of this phenomenon is that there must have been a beneficial influence effected upon digestion by the supplements when fed in the proportions given. While the effect of the ration upon each sow of each lot in most cases checked, yet no definite conclusions can be drawn regarding the specific effect of the rations owing to the small number of sows upon each ration.

SEASONAL EFFECTS UPON THE MAINTENANCE REQUIREMENTS OF BROOD SOWS IN TERMS OF DIGESTIBLE NUTRIENTS.

That a greater amount of feed is required for maintenance of sows in winter than in summer was determined by dividing the year in two equal parts, namely, -winter from Nov. 18 to May 19, and summer from May 19 to Nov. 17, and then finding the food nutrients eaten by the sows for each season. The following table has been prepared to bring out the seasonal requirements of sows not suckling pigs:-

SEASONAL REQUIREMENTS OF SOWS NOT SUCKLING PIGS, (in NUTRIENTS.).

No. of SOW	Ration	Avg. Wt. of Sows in Winter	Avg. Wt. of Sows in Summer	Days not Suckling in Winter	Days not Suckling in Summer	Avg. Total Nutrients eaten in winter per head per day	Avg. Total nutrients eaten in summer per head per day	Avg. Total nutrients per cwt. in winter per day	Avg. Total Nutrients per cwt. in Summer per Day.
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
31	Corn and Tankage	281.5	285.3	220	162	2.225	2.147	.790	.752
1	Corn and Tankage	260.1	301.5	139	147	2.806	1.653	1.079	.548
2	Corn and Oil-meal	252.2	262.0	189	182	2.278	1.940	.903	.740
30	Corn and Oil-meal	281.5	---	56	---	2.395	---	.850	---
20	Corn and Shorts	242.7	235.6	191	181	2.525	2.504	1.040	1.063
14	Corn and Shorts	322.9	335.4	245	133	2.644	2.125	.819	.633
11	Corn and Bran	284.1	291.2	282	182	2.602	2.713	.916	.931
13	Corn and Bran	315.0	---	155	---	2.474	---	.759	---
AVERAGES		280.0	285.1	184.6	164.5	2.493	2.180	.894	.778

The table shows that the total digestible nutrients required for maintenance in winter exceeds the maintenance requirements of summer by 14.9 per cent. The average maintenance requirements in terms of food nutrients for winter was 8.94 pounds of digestible nutrients; and for summer, 7.78 pounds of digestible nutrients. It is obvious then that for sows which are in moderate condition and without a thick covering of fat for protection there must be provided greater amounts of feed in winter for maintenance purposes alone. The extra amount of feed necessary for maintenance in winter must represent the amount of feed necessary to furnish the extra amount of heat lost by radiation in winter as compared with summer. The relation between summer and winter requirements in this experiment are in accord with work done by Cooke* in a series of experiments on swine at the Colorado Station. He found that the following amounts of computed digestible matter were required for maintenance per hundred pounds live weight, for animals weighing 85 to 182 pounds per head:-

In hot weather.....0.93 lbs.

In moderate weather.....1.25 "

In cold weather..... 1.41 "

Contrary to the results obtained by Cooke at Colorado and to the results of this experiment, Sanborn[†] in experiments upon the maintenance ration of swine found the amount of

*Armsby's Principles of Nutrition p.438.

†Mo. State Agr. Coll. Bull. 28, pp. 5 and 6.

calculated digestible nutrients required per hundred weight
to be as tabulated below:-

	Live weight lbs.	Maintenance Require- ment, per 100 Pounds lbs.
Winter (temp.about 40 F.)...	173.5	1.65
	171.6	1.89
Summer (" " 80 F.)...	173.6	2.02
	48.3	2.07

The second summer's experiment given in the forego-
ing table is hardly comparable with the others, since the
smaller animal would require a relatively greater maintenance
ration. The remaining experiments seem to show a lower re-
quirement for maintenance for winter than for summer. The data
for the winter trial was, however, obtained from an experiment
which was carried on in very moderate winter weather. Sanburn
states in giving the results of the experiment that "unfortu-
nately February (the month when the winter trial was conducted)
^{persisted}
in being a very warm month."

The following table has been prepared to show the
cost of maintenance for winter and summer, in terms of feed
and cost of feed:-

EFFECT OF SEASON ON FOOD REQUIREMENTS OF SOW.

No. of Lot	No. of Sow	Ration	Average Weight of sows in Winter	Average Weight of sows in Summer	Days not Suckling in Winter	Days not Suckling in Summer	Average Grain eaten per day in Winter	Average Grain eaten per day in Summer	Average Hay eaten per day in Winter	Average Hay or equivalent eaten per day in Summer	Average Feed per Head per day in Winter	Average Feed per Head per day in Summer	Average Cost per Day in Winter	Average Cost per day in Summer	Average feed per Cwt. per day in Winter	Average feed per Cwt. per day in Summer	Average Cost per Cwt. per day in Winter	Average cost per Cwt. per day in Summer
			lbs.	lbs.	days	days	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
III	31	Corn and Tankage	281.5	285.3	220	162	2.005	1.422	1.695	2.278	3.700	3.700	2.012	2.667	1.314	1.296	.715	.935
III	1	Corn and Tankage	260.1	301.5	139	147	3.246	1.029	1.289	1.757	4.535	2.786	4.120	2.001	1.743	.924	1.584	.664
IV	2	Corn and Oilmeal	252.2	262.0	189	182	1.192	2.131	1.557	2.049	2.749	4.180	2.024	3.235	1.090	1.595	.803	1.235
IV	30	Corn and Oilmeal	281.5		56		2.869		.338		3.207		3.232		1.139		1.148	
II	20	Corn and Shorts	242.7	235.6	191	181	2.237	2.037	1.985	2.055	4.222	4.092	3.324	3.146	1.739	1.737	1.369	1.335
II	14	Corn and Shorts	322.9	335.4	245	133	2.852	1.648	1.349	1.780	4.201	3.428	3.634	2.525	1.301	1.022	1.125	.753
I	11	Corn and Bran	284.1	291.2	282	182	2.631	2.991	1.595	1.257	4.226	4.248	3.637	3.745	1.487	1.459	1.280	1.286
I	13	Corn and Bran	315.0		155		2.621		1.288		3.909		3.352		1.241		1.064	
			280.0	285.1	184.6	164.5	2.456	1.876	1.387	1.862	3.843	3.739	3.166	2.886	1.381	1.339	1.136	1.034

The table shows that for any season of the year the total consumption of feed per head or per hundred weight is practically the same, but it also shows that there must be a difference in the character of the food. The average total feed consumed per head per day was:-

3.843 pounds for winter

3.739 " " summer.

and the average feed per hundred weight per sow was:-

1.381 pounds for winter

1.339 " " summer.

But the average grain and hay consumed per day for each season was:-

FEED EATEN PER HEAD PER DAY.

	Grain	Hay	Total
Winter	2.456	1.337	3.843
Summer	1.876	1.862	3.738

There was a tendency then toward a standard gross amount of feed at all seasons of the year with sows on maintenance; but for winter feeding the ration had to contain a greater proportion of grain. It was necessary to supply 32.3 percent more grain per head for maintenance in winter than in summer. This was due to the greater amount of net energy necessary for heat production.

The average cost of maintenance per sow per day was:-

3.166 cents for winter.

2.866 " " summer

Per hundred weight per day, the average cost was,-

I.136 cents for winter

I.034 " " summer

The cost per head per day for winter maintenance exceeded that for summer by 9.71 per cent, or the cost of maintenance for winter was about one tenth greater than for summer.

Undoubtedly extremes of either heat or cold may have an unfavorable effect upon the maintenance requirement of swine; and since there is such a close relationship between the maintenance and gains produced, it would seem that most profitable gains can be made in moderate weather, or when fattening animals can be made most comfortable. When it becomes necessary for the animal to use food nutrients solely for the raising or lowering of body temperature there certainly is a waste of food taking place that could well be used for the production and storage of fat.

TOTAL FEED REQUIRED FOR MAINTENANCE OF SOWS NOT
SUCKLING PIGS.

It is necessary to ascertain the cost of maintenance of the sow before the actual cost of production of the pig can be determined. There must be apportioned to each pig at farrowing time the cost of maintenance of the dam for the time intervening from the weaning time of the previous litter, or the total cost of maintenance of the sow for the year must be apportioned to each pig produced throughout the year. The latter method has been used in this experiment in determining the charge that must be made against each pig for the maintenance of the dam. In order to determine the average cost of

maintenance per day of sows per lot the following table has been prepared, in which is given the average pounds of feed consumed by each lot of sows for an average of 309.4 days, while not suckling pigs.

TOTAL FEED EATEN BY EACH SOW WHEN NOT SUCKLING PIGS.

Ration	Avg. Weight of Sows	Number of Days	Avg. Grain Eaten per Day per Head Per Lot	Hay Eaten per Day per Head	Total Feed Eaten per Cwt. per Day	Grain per Cwt. per Day	Hay per Cwt. per Day	Cost of MAINTENANCE	
								Per Head per Day	per Cwt. per day
	lbs.	Days	lbs.	lbs.	lbs.	lbs.	lbs.	cts.	cts.
Corn and Tankage	283.1	382)							
Corn and Tankage	280.8	292)	4.883	2.0000	1.377	.668	.709	2.884	1.022
Corn and Oilmeal	256.9	371)							
Corn and Oilmeal	281.5	56)	2.275	1.393	1.374	.836	.538	3.067	1.140
Corn and Shorts	239.5	372)							
Corn and Shorts	326.8	378)	2.265	2.136	1.606	.812	.794	3.426	1.243
Corn and Bran	286.8	469)							
Corn and Bran	315.0	155)	2.668	1.476	1.383	.889	.494	3.409	1.139
	284.8	309.4	2.272	1.751	1.435	.801	.631	3.196	1.136

The table shows the average amount of grain consumed by the sows in this experiment to be 2.272 pounds per head per day. The cost of maintenance varied from 2.58 cents to 3.43 cents per day. The average cost of maintenance for the eight sows was 3.20 cents per day. The cheapest maintenance was made with corn, tankage, and clover hay. It is also clearly demonstrated that roughage in the form of clover hay, when fed ad libitum, can well be substituted for a portion of the high priced grain ration, when sows are not suckling pigs. The sows in this experiment, when hay was kept constantly before them, consumed hay to the extent of 43.5 per cent or nearly half of the entire daily ration,—and this too with clover hay that would not average more than medium in quality. It is further shown that brood sows may easily be made to consume from 1.75 to 2.50 pounds of hay per day while dry and on maintenance.

We should not get away from the fact that the hog is a grazing animal and requires some crude fiber in the ration to insure active digestion and the best health. A pound or two of aftermath or third cutting of alfalfa hay will even produce better results with the brood sow than a grain ration alone. Rommel* states that "when hogs are confined to an exclusive grain ration, and especially when this is made up of a single grain the addition of a moderate amount of hay to the ration will be relished and less grain will be required".

* U.S. Dept. of Agr. Bureau of Animal Industry, Bul. 47, page 174.

Morton* found that a dry brood sow may even be maintained without the use of grain when good alfalfa and beets are used. Bright clover hay, alfalfa, soybean hay, or cowpea hay may in good economical practice make up from one-fourth to one-half of the entire ration of the dry brood sow in the winter.

In order to show the total cost of maintenance per head for one year, the following table has been prepared:-

* Wyoming Sta. Bul. 74, p 18.

TOTAL COST OF MAINTENANCE OF SOWS NOT SUCKLING PIGS PER YEAR.

DIET	Grain Eaten per Day	Hay Eaten per Day	Grain Eaten per Cwt. Per Day	Hay Eaten per Cwt. Per Day	Total Corn Eaten for 365 Days per Sow	Total Supplement eaten for 365 Days Per Sow	Total Grain eaten for 365 Days Per Sow	Total Hay eaten for 365 Days	Total cost of Maintenance for 365 Days.
	lbs.	lbs	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	
Corn and Tankage	1.883	2.000	.668	.709	632.9	54.68	687.58	730.0	\$10.53
Corn and Meal	2.275	1.393	.836	.538	761.2	68.62	829.82	508.4	11.19
Corn and Shorts	2.265	2.136	.812	.798	553.0	273.50	826.50	779.5	12.50
Corn and Bran	2.668	1.476	.889	.494	649.4	322.80	972.20	538.8	12.43
							829.02	639.2	11.66

The cheapest cost of maintenance was \$10.53, with the corn, tankage and clover hay ration. The highest cost was \$12.50, with corn, shorts, and clover hay. The average cost of maintenance for one year was \$11.66.

BIRTH COST OF PIGS.

The charge that must be made each litter of pigs at farrowing time will be \$11.66 plus the litter's share of the keep of the boar. Assuming that there may be accredited to each boar 75 pigs per year and that the boar's cost of maintenance will be the same as for sows, then the boar's charge that must be made against each pig will be 15.5 cents. The remaining charge per pig will depend upon the number of pigs raised. The following table will show the average birth charge where the number of pigs per sow per year varies from 1 to 12.

If the number raised is.....	1	2	3	4	5	6
The farrowing charge per pig will be	\$11.82	\$ 5.91	\$3.60	\$2.85	\$2.36	\$1.97
Continued	7	8	9	10	11	12
	\$1.68	\$1.48	\$1.31	\$1.18	\$1.07	\$.98

The importance of prolificacy is readily seen from the above data. If a sow produces but six pigs per year instead of ten, the initial or birth cost of the pig is increased by 66.9 per cent or his birth cost, is increased by two-thirds. The difference in cost, when considered for but one pig, indeed seems small, but when considered for one hundred pigs it is certainly too great to be ignored. The difference in the total birth charge for 100 pigs produced from 10 sows in one year as com-

pared with 100 pigs produced from 16.6 sows in one year is \$79.00. If there is but an increase of one pig per litter, say from a litter of six to a litter of seven, the birth charge is lowered by 15.2 per cent or for 100 pigs there will be a saving of \$30.00 effected. If a still larger litter is produced, say 8 pigs, the birth charge will be lowered by 33.5 percent or for 100 pigs there will be a saving of \$66.00 effected. It would seem that the character of prolificacy cannot be overestimated and that too little importance has been placed upon it in the past. Just as the manufacturer lowers the cost of production by increasing the efficiency of the factory so that a larger amount of finished material per man employed passes out, so the breeder should lower the cost of production by increasing the efficiency of the breeding herd through selection, to gain prolificacy.

FOOD REQUIRED TO PRODUCE A 40# PIG.

In calculating the cost of producing pigs to weaning time the cost of the feed eaten by the sow, over and above the maintenance requirement of the sow, was charged to the pigs. The maintenance requirement was taken to be the average amount of feed required for maintenance while not suckling pigs. An endeavor was made to keep each sow at her maintenance weight while suckling her pigs, through increasing the ration. This in most cases was impossible, but it was possible in most cases to bring the sow to maintenance weight before weaning the pigs. Where this was not done, the feed above maintenance required

to bring the sow to maintenance weight was charged against the litter of pigs.

Since the differences in the amount of feed of each ration to produce a 40 pound pig at weaning time were not greater than the differences in food requirements of sows upon the same ration, an average of all the litters was taken to determine the amount of food required, to produce a pig to weaning time. In order to place each ration upon the same basis the following table, showing the requirements in pounds of digestible nutrients, was prepared.

DIGESTIBLE NUTRIENTS TO PRODUCE A FORTY POUND PIG.

Number of Days Suckling	Total Nutrients eaten by sow while Suckling pigs	Total maintenance nutrients required by sow for Suckling period	Total nutrients above maintenance to produce the litter to weaning time	Total nutrients other than sow's milk consumed by pigs	Total nutrients above the sow's maintenance to produce the litter	Total nutrients above the sow's maintenance to produce a 40# pig.
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
87	442.69	190.70	251.99	0	251.99	116.05
177	928.76	390.49	538.27	54.72	592.99	104.03
98	605.55	207.17	398.38	71.93	470.31	119.02
102	517.97	244.30	273.67	70.64	344.31	79.51
97	710.92	243.95	466.97	54.33	521.30	111.70
91	416.50	229.41	187.09	49.50	236.59	145.59
						112.65

The table shows that the average amount required above the sow's maintenance to produce a 40 pound pig was 112.65 pounds of digestible nutrients. In terms of feed, if a ration of eight parts corn meal and one part tankage were used, this would represent an expenditure of 149.56 pounds of corn and 18.69 pounds of tankage to produce a 40 pound pig. With corn at 56 cents per bushel and tankage at \$40.00 per ton this would mean a cost of \$1.87 for actual food consumed from birth to weaning. This we believe to be a fair charge against the pig for the actual food nutrients consumed from birth to weaning time.

The remaining charge, will be dependent entirely upon the number of pigs produced by the sow throughout the year to weaning time. The following table has been prepared to show the total charge against a 40 pound pig at weaning time where the number of pigs raised by the sow varies from 1 to 16.

EFFECT OF SIZE OF LITTER UPON THE COST OF THE
 PIG AT WEANING TIME.

Number of pigs raised during the year.	Birth charge per pig.	Cost of feed per pig from birth to weaning.	Total cost of pig at weaning.
I	\$11.82	\$1.87	\$13.69
2	5.91	1.87	7.78
3	3.60	1.87	5.47
4	2.85	1.87	4.72
5	2.36	1.87	4.23
6	1.97 ✓	1.87 ✓	3.84
7	1.68 ✓	1.37 ✓	3.55 ✓
8	1.48	1.37	3.35
9	1.31	1.37	3.18
10	1.18	1.37	3.05
11	1.07	1.37	2.94
12	.98	1.37	2.85
13	.91	1.37	2.78
14	.84	1.37	2.71
15	.79	1.37	2.66
16	.74	1.37	2.61

The charge of \$1.87 has been classed as a fixed charge. Ostertag and Nuntz* have shown that "the food requirement of sows is not greater than the maintenance requirement plus the material necessary for the milk yield". The maintenance requirement of the sow remains the same then whether the litter be large or small and the food consumed above maintenance is proportional to the size of the litter. All feed above the maintenance requirements of the sow is used for the production of gain in weight of the litter, and must be charged as food used in the production of gain in the litter.

*Lanswirtschaftliche Jahrbucher, 37(1908) no.2.

The table again clearly shows the importance of prolificacy upon the cost of production for marker purposes. If 12 pigs per year be produced from two sows the total cost at weaning time for feed will be \$46.08, while if the 12 pigs be produced from one sow the total cost of feed will be \$34.20,- or there will be effected a saving of \$11.88. The average cost of producing pigs to weaning time where but six pigs are raised per sow per year, is \$3.84; where twelve pigs are raised per sow per year, \$2.85. If the cost of the sows maintenance is charged against the pig it will be noticed the cost of producing the pig to weaning time is not the smallest cost per pound gain throughout the lifetime of the pig. The average cost per pound at weaning time, from the data given where six pigs per sow per year are raised, is 9.6 cents. However, the actual food consumed in producing a pound gain previous to weaning does seem to indicate that gains can be put on the pig during the suckling period more cheaply than after weaning. The total cost at weaning time does, however, represent the cost of food consumed, plus the pig's share of the keep of the dam. The cost of the pig at birth or at weaning time is then largely dependent upon the size of the litter.

SUMMARY.

Although it is true that only a series of experiments upon any phase of animal nutrition are conclusive, yet this experiment would seem to show that:—

I. The average total digestible nutrients required for maintenance of brood sows per 1000 pounds live weight is



8.41 pounds, which is slightly greater than is required for maintenance of cattle and horses.

2. The ratio of food nutrients required by sows for maintenance, as compared with horses, as shown by these experiments, is as 1.43:1.

3. The total digestible nutrients required for maintenance in winter exceeds the maintenance requirements of summer by 14.9 per cent.

4. The maintenance requirements of sows in winter is 8.94 pounds of digestible nutrients, and in summer, 7.78 pounds.

5. The cost of maintenance per sow (averaging 280 pounds) per day, with feeds at the prices given, is 3.166 cents.

6. The cost per head per day for winter maintenance exceeds that for summer by 9.71 per cent or the cost of maintenance, where hay is given ad libitum throughout the year, is for winter, about one-tenth greater than for summer.

7. The average amount of grain consumed daily by 280 pound brood sows on maintenance, when hay ^{is} given ad libitum, is 2.272 pounds.

8. When good clover hay is kept constantly before dry brood sows it may be consumed to the extent of 43.5 to 90.0 per cent of the entire daily ration.

9. Brood sows may easily be made to consume from 1.75 to 2.50 pounds of clover hay per day while dry and on maintenance, and it may easily take the place of some of the high priced grain feeds. Some roughage in the sow's ration is better than a clear grain ration.

10. The average cost of maintenance of brood sows per head per day, with feeds at the prices given, is 3.20 cents.

11. The cheapest cost of maintenance is made with a ration of 11 parts corn meal, 1 part tankage and hay ad libitum.

12. The average cost of maintenance of brood sows for one year is \$11.66.

13. If a sow produce 6 pigs per year instead of 10 the initial or birth cost of each pig is increased by 66.9 per cent. If the average number produced per sow per year is increased but from 6 to 7 pigs the birth charge per pig is lowered by 15.2 percent or for 100 pigs there will be a saving of \$30.00 effected.

14. The difference in the total birth charge for 100 pigs produced from 10 sows in one year as compared with 100 pigs produced from 16.6 sows in one year is \$79.00.

15. The average amount of digestible nutrients required above the sow's maintenance to produce a 40 pound pig at weaning time is 112.65 pounds.

16. The average cost of producing a 40 pound pig from birth to weaning time is \$1.87, to which must be added a proportionate share of the sow's maintenance cost.

17. The average feed cost at weaning time where 6 pigs per sow per year are produced is \$3.84; where 8 pigs are produced \$3.35; where 10 pigs are produced \$3.05; where 12 pigs are produced \$2.85; where 14 pigs are produced \$2.71; and where 16 pigs are produced \$2.61.

BIBLIOGRAPHY ON MAINTENANCE OF BROOD SOWS
AND COST OF PIGS TO WEANING TIME.

Cost of Pigs from Birth to Maturity.

Carlyle, W.L.,- Wis. Exp. Sta. Bul. 104.

Curtiss, C.F.,- Ia. Exp. Sta. Bul. 14, pp 162-165.

Farmer's Bulletin, Number 202, pp 24-27.

Cost of Pigs at Weaning Time.

Clark, R.W.,- Utah. Exp. Sta. Bul. 101, pp 165-
179, 188-201.

Day, G.E.,- Ann. Rpt. Ontario Agr. Col. and Exp.
Farm, 31 (1905) pp 136-142.

Day, G.E.,- Ann. Rpt. Ontario Agr. Col. and Exp.
Farm 32 (1906) pp. 151-158.

Cost of Producing Pigs.

Carlyle, W.L.,- Col. Agr. Exp. Sta. Rpt. 1904,
pp. 103, 104.

Cooke, W.W.,- Vt. Exp. Sta. Bul. 18.

McLain, N.W.,- Minn. Exp. Sta. Bul. I4.

Wilson, J., Patrick, G.E., Curtiss, C.F., and

Kent, D.A.,- Ia. Exp. Sta. Bul. I4, (I89I).

Digestion,- Activity of, in Swine.

Sachs, landw. Ztschr., I893, No. 52, pp. 725-728.

Digestion,- Power of Digestion of Different Breeds.

Lillenthal in Landw. Wehnl. Schleswig-Holstein,

50, (I900), No. 5, pp. 8I-89.

Dry Matter in Feed Required to Produce a Pound of Gain
in Swine.

Lindsey, J.B.,- Mass. Exp. Sta. Bul. No. 47, I893

also Mass. State Rpt. for I893.

Farrowing Data,- Weights of Sows and Pigs at Weaning Time.

Carlyle, W.L.,- Wis. Exp. Sta. Bul. I04.

Henry, W.A.,- Wis. Rpt. for I897 pp. 8-9.

Farmer's Bulletin, No. 97, p.I2.

Feed for Sows, Previous to and after Weaning,-

Coburn, F.D.,- "Swine in America", I909.

Dietrich, Wm.,- "Swine", I9I0.

Smith, H.R.,- "Profitable Stock Feeding" I905.

Food Requirements of Swine.

Brandt,- in Deut. Landw. Presse, 35 (1908) No.6,
pp. 55, 56.

Dietrich, Wm.,- "Swine" 1910.

Dietrich, Wm.,- Ill. Exp. Sta. Cir. 126.

Hansson, N.,- Nord. Mejeri Tidn. 23 (1908),
Nos. 42, pp. 495, 497; 43 pp. 508, 509;
44 pp. 520-522.

Food Requirements and Milk Secretion of Pigs.

Ostertag, R., and Nuntz, N., et al. in Landw.
Jahrb. 37 (1908), No. 2, pp. 201-260.

Gains of Pigs, before and after Weaning.

Duggar, J.F.- Ala. Col. Bul. No. 122, 1903.

Henry, W.A.,- Wis. Exp. Sta. Rpt. 1889, pp. 24-31;
36-41; 233-243. Wis. Exp. Sta. Rpt. 1890, pp 42-52.
Wis. Exp. Sta. Rpt. 1897, pp. 20-28.

Smith, C.D.,- Mich. Exp. Sta. Bul. No. 133, 1896.

Wheeler, W.P.,- N.Y. State Exp. Sta. Rpt. 1895,
pp. 475-493.

Hay for Swine.

Alfalfa Hay for,-

Buffum, B.C., and Griffith, C.J.,- Col. Exp. Sta.
Bul. No. 74.

Cottrell, H.M.,- Kans. Exp. Sta. Bul. No. 85, 1899.

Cottrell, H.M.,- Col. Exp. Sta. Bul. No. 146, 1909.

Cottrell, H.M., Otis, D.H., and Haney, J.G.,-

Kans. Exp. Sta. Bul. No. 95, 1900.

Foster, L., Merrill, L.A.,-Utah Exp. Sta. Bul. No.

70, 1900.

Linfield, F.B.,- Mont. Exp. Sta. Bul. No. 57, 1905.

McDowell, R.H.,- Nev. Exp. Sta. Bul. No. 40, 1898.

Sanborn, J.W.,- Utah Second Ann. Rpt. 1891, pp.20-40.

Shaw, R.S.,- Mont. Exp. Sta. Bul. No. 27, 1900.

Smith, H.R.,-"Profitable Stock Feeding", 1905.

Snyder, W.P.,- Neb. Exp. Sta. Bul. No. 99, 1907.

Kansas Experiment Station Press Bulletin, No. 25.

Kansas Experiment Station Bulletin, No.99.

Farmer's Bulletin, No. 97, U.S.Dept. of Agr.

Clover Hay for Hogs,-

Smith, H.R.,- "Profitable Stock Feeding", 1905.

Withycombe, J.,- Ore. Rpt. for 1901, pp. 22, 23.

Cowpea Hay for Pigs,-

Burtis, F.C.,- Okla. Exp. Sta. Rpt. for 1901,

pp. 108-111.

Maintenance of Brood Sows on Hay.

Morton, G.E.,- Wyo. Exp. Sta. Rpt. for 1905, pp. 44-47

Smith, H.R.,- Neb. Exp. Sta. Press Bul. No. 20, 1904.

Maintenance and Growth of Pigs.

Carlyle, W.L.,- Wis. Exp. Sta. Bul. No. 104, 1903.

Dietrich, Wm.,-Wis. Exp. Sta. Rpt. for 1899, pp. 31-43.

" " , -Ill. Exp. Sta. Cir. 126, also Cir. 133.

" " , -"Swine", 1910.

Sanborn, J.W.,- Mo. Agr. Col. Bul. No. 28, 1889.

Taylor, F.D.,- Wis. Exp. Sta. Rpt. for 1901, pp 67-72.

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A P P E N D I X .

Lot I.

RECORD OF SOW - 11-

corn 2 parts. Bran 1pt.
Clover hay ad libitum

Date	1908	corn.	Bran	Clover	Refuse	Weight	Gain	Loss
18 - Nov 25		8.50	3.50	8.00	4.31	300		5
26 - Dec 2		7.00	3.50	5.50	1.13	299		4
3 - " 16		7.00	3.50	6.50	1.78	298		3
10 - " 23		7.00	3.50	8.00	2.13	284	6	10
24 - Jan 6, 09		7.00	3.50	8.50	2.25	280		4
31 - " 13		7.00	3.50	8.50	2.75	270		10
7 - " 20		7.00	3.50	10.50	3.25	268		2
14 - " 27		7.00	3.50	10.50	3.25	266		2
21 - Feb 3		7.25	3.75	13.75	3.20	262		
28 - " 10		7.75	3.75	10.50	1.75	270		
11 - " 17		7.75	3.75	11.00	1.12	270		
18 - " 24		7.75	3.75	11.00	1.37	274		
25 - March 3		7.75	3.75	10.25	8.50	270	4	
4 - " 10		7.75	3.75	11.00	10.25	270	4	
11 - " 17		7.75	3.75	11.00	13.62	273	3	
18 - " 24		7.75	3.75	14.50	14.25	271	8	
25 - " 31		7.25	3.25	13.75	13.37	279		
1 - April 7		7.50	3.75	14.50	12.25	275		
8 - " 14		7.50	3.75	14.50	12.25	274		
15 - " 21		7.50	3.75	14.50	18.00	285		
22 - " 28		7.50	3.75	14.50	18.25	285		
29 - May 5		7.50	3.75	14.00	5.75	282		
6 - " 12		7.50	3.75	14.00	4.00	265		
13 - " 19		7.50	3.75	13.00	8.7	269		
20 - " 26		7.50	3.75	7.00	1.00	268		
27 - June 2		7.50	3.75	7.00	1.00	268		
4 - " 9		7.50	3.75	7.00	1.00	268		
11 - " 16		7.50	3.75	7.00	1.00	268		
18 - " 23		7.50	3.75	7.00	1.00	268		
25 - " 30		7.50	3.75	7.00	1.00	268		
1 - July 7		7.50	3.75	7.00	1.00	268		
8 - " 14		7.50	3.75	7.00	1.00	268		
15 - " 21		7.50	3.75	7.00	1.00	268		
22 - " 28		7.50	3.75	7.00	1.00	268		
29 - Aug 4		7.50	3.75	7.00	1.00	268		
5 - " 11		7.50	3.75	7.00	1.00	268		
12 - " 18		7.50	3.75	7.00	1.00	268		
19 - " 25		7.50	3.75	7.00	1.00	268		
26 - Sep 1		7.50	3.75	7.50	1.50	269		
3 - " 8		7.50	3.75	7.50	1.50	269		
10 - " 15		7.50	3.75	7.50	1.50	269		
17 - " 22		7.50	3.75	7.50	1.50	269		
24 - " 29		7.50	3.75	7.50	1.50	269		
31 - Oct 6		7.50	3.75	7.50	1.50	269		
7 - " 13		7.50	3.75	7.50	1.50	269		
14 - " 20		7.50	3.75	7.50	1.50	269		
21 - " 27		7.50	3.75	7.50	1.50	269		
28 - Nov 3		7.50	3.75	7.50	1.50	269		
5 - " 10		7.50	3.75	7.50	1.50	269		
12 - " 17		7.50	3.75	7.50	1.50	269		
19 - " 24		7.50	3.75	7.50	1.50	269		
26 - Dec 1		7.50	3.75	7.50	1.50	269		
Jan 8		7.50	3.75	7.50	1.50	269		
15 - " 15		7.50	3.75	7.50	1.50	269		
22 - " 22		7.50	3.75	7.50	1.50	269		
29 - " 29		7.50	3.75	7.50	1.50	269		
30 - Jan 5, 10		7.50	3.75	7.50	1.50	269		
6 - " 12		7.50	3.75	7.50	1.50	269		
13 - " 19		7.50	3.75	7.50	1.50	269		
20 - " 26		7.50	3.75	7.50	1.50	269		
27 - " 3		7.50	3.75	7.50	1.50	269		
3 - " 10		7.50	3.75	7.50	1.50	269		
10 - " 17		7.50	3.75	7.50	1.50	269		
17 - " 24		7.50	3.75	7.50	1.50	269		
24 - Mar 2		7.50	3.75	7.50	1.50	269		
3 - " 9		7.50	3.75	7.50	1.50	269		
10 - " 16		7.50	3.75	7.50	1.50	269		
17 - " 23		7.50	3.75	7.50	1.50	269		
24 - " 30		7.50	3.75	7.50	1.50	269		
31 - Apr 6		7.50	3.75	7.50	1.50	269		

Refused hay for two weeks

Feb. 26, 1909 Bred to Ornament

Apr 17 taken from Lot 1 and put in barn

Sow was sick, refused feed cholera

Sep 2 changed from bluegrass to clover

Oct 20, Bred to Ornament

Dec 23, Bred to Meddler

Lot-1-

RECORD of Sow - 11 -

Pounds of Digestible Nutrients eaten

Date 1908	Protein	Nitrogen-free-Extract	Ether-Extract	Total Digestible Nutrients	Weight	Nutritive Ratio of Food Eaten
Nov 18 - Nov 25	1.09	7.04	.45	8.58	300	7.4
" 26 - Dec 2	1.05	6.30	.41	7.76	295	6.9
Dec 3 - "	1.30	7.78	.47	9.55	288	6.8
" 10 - "	1.29	7.73	.47	9.49	278	6.9
" 17 - "	1.37	8.14	.49	9.00	284	6.8
" 24 - " Jan 6, 09	1.39	8.28	.50	10.17	270	6.8
" 31 - Jan 13, 09	1.49	8.81	.52	10.82	270	6.8
Jan 7 - "	1.46	8.63	.51	10.60	268	6.8
" 14 - "	1.46	8.60	.51	10.60	266	6.7
" 21 - " Feb 3	1.63	9.60	.57	11.80	270	6.7
" 28 - Feb 10	2.73	16.18	.98	20.55	270	6.9
Feb 4 - "	2.79	16.72	1.04	21.05	274	6.9
" 11 - "	2.77	17.12	1.06	21.45	274	6.9
" 18 - " Mar 3	2.92	17.45	1.08	22.15	270	6.8
" 25 - Mar 10	2.94	17.49	1.08	22.22	273	7.1
Mar 4 - "	3.05	18.06	1.10	22.28	275	7.1
" 11 - "	2.90	17.31	1.07	21.28	271	6.9
" 18 - " Apr 7	2.90	17.26	1.06	21.22	271	6.8
" 25 - " Apr 14	3.17	18.86	1.16	23.19	279	6.8
Apr 1 - Apr 7	3.28	19.47	1.20	23.95	274	6.8
" 8 - " Apr 14	3.28	19.47	1.20	23.95	274	6.8
" 15 - " Apr 21	4.07	24.22	1.50	29.79	285	6.8
" 22 - " May 5	3.23	19.20	1.19	23.62	280	6.8
" 29 - May 12	2.84	17.14	1.08	21.06	275	6.9
May 6 - "	3.01	18.03	1.13	22.17	282	6.9
" 13 - " May 19	3.09	18.31	1.27	24.21	265	7.2
" 20 - " June 2	1.33	8.04	.49	9.86	271	6.9
" 27 - June 9	2.62	16.22	1.04	19.88	269	7.1
June 3 - "	2.62	16.19	1.03	19.84	280	7.1
" 10 - " July 7	2.61	16.11	1.03	19.75	280	7.1
" 17 - " July 14	2.66	16.46	1.04	20.16	281	7.1
" 24 - " July 30	2.80	17.40	1.08	21.28	285	7.1
July 8 - July 14	1.67	10.39	.63	12.69	269	7.1
" 15 - " Aug 4	2.53	15.88	.97	19.38	287	7.2
" 22 - " Aug 11	2.68	16.88	.97	20.13	293	7.0
" 29 - Aug 28	2.84	17.54	1.07	21.39	289	7.1
Aug 5 - " Aug 11	2.50	15.50	.93	18.96	291	7.0
" 12 - " Aug 18	2.39	14.57	.88	17.84	285	7.0
" 19 - " Aug 25	2.63	16.15	.95	19.73	297	7.0
" 26 - Sep 1	2.19	13.29	.84	16.32	299	7.0
Sep 3 - " Sep 8	3.21	18.70	1.10	23.01	297	7.0
" 10 - " Sep 15	2.90	17.09	1.03	21.02	300	6.7
" 16 - " Sep 22	2.80	16.55	1.00	20.35	300	6.8
Aug 5 - " Oct 11	2.82	16.64	1.01	20.47	300	6.8
" 12 - " Oct 18	2.80	16.64	1.01	20.47	300	6.8
" 19 - " Oct 25	2.63	16.15	.95	19.73	297	7.0
" 26 - Oct 6	2.80	16.64	1.01	20.47	300	6.8
Oct 7 - " Oct 13	2.83	16.73	1.01	20.57	300	6.8
" 14 - " Oct 20	3.62	20.84	1.21	25.67	300	6.6
" 21 - " Oct 27	1.95	11.90	.79	14.82	308	6.6
" 28 - Nov 3	2.74	15.91	.93	19.58	300	6.9
Nov 4 - " Nov 10	2.27	13.27	.79	16.33	305	6.6
" 11 - " Nov 17	2.05	12.10	.73	14.88	300	6.7
" 18 - " Dec 1	2.05	12.10	.73	14.88	300	6.8
" 25 - Dec 8	2.35	13.71	.81	16.87	301	6.7
Dec 9 - " Dec 15	3.61	20.33	1.13	25.07	300	6.9
" 16 - " Dec 22	2.01	11.92	.73	14.66	305	6.8
" 23 - " Dec 29	1.96	11.65	.71	14.32	305	6.8
" 30 - Jan 5, 10	2.12	12.56	.75	15.43	305	7.2
Jan 6 - " Jan 12	1.47	9.06	.59	11.12	285	7.1
" 13 - " Jan 19	1.47	9.06	.59	11.12	290	7.1
" 20 - " Jan 26	2.89	16.58	.95	20.42	295	6.5
" 27 - Feb 3	2.44	14.16	.83	17.43	300	6.6
Feb 3 - Feb 9	2.20	12.91	.77	15.88	294	6.7
" 10 - " Feb 16	2.25	13.18	.79	16.22	295	6.7
" 17 - " Feb 23	2.56	14.79	.86	18.21	294	6.7
" 24 - Mar 2	2.78	15.95	.92	19.66	294	6.7
" 31 - Mar 8	2.80	16.04	.92	19.76	299	6.5

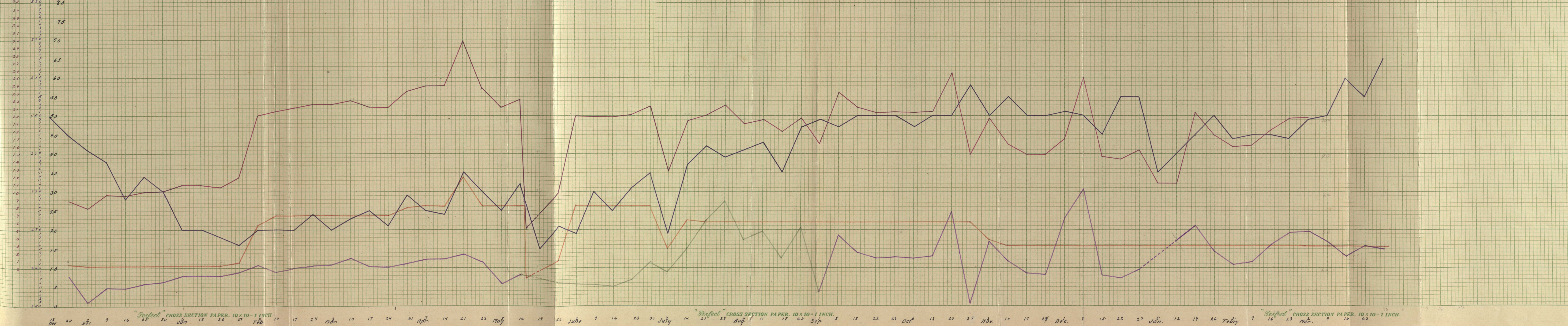
SOW-11- Lot-1-

Total
Digestible
Nutrients

Weights

Total
Feed
Eaten

Blue Weight of Sow
Red Total digestible nutrients eaten
Orange Grain eaten
Purple Hay eaten
Green Blue-grass eaten



LOT-I-

RECORD OF SOW - 13 -

Corn 2 pts, Bran 1 pt.
Clover hay ad libitum.

Date 1908	Corn	Bran	Clover	Refuse	Weight	Gain	Loss
Nov. 18-18							
Nov. 18-25	8.50	3.50	8.00	4.31	3.10		5
Nov 26-Dec 2	7.00	3.50	6.00	1.13	3.04		6
Dec 3-16	7.00	3.50	6.50	1.78	3.04		2
" 17-23	7.00	3.50	8.00	2.13	2.99	6	9
" 24-30	7.00	3.50	8.50	2.25	3.08	9	9
" 31-Jan. 6	7.00	3.50	0.50	2.75	3.08	2	
" 7-13	7.00	3.50	0.50	3.05	3.10	9	
" 14-20	7.50	3.75	1.50	3.25	3.01		
" 21-27	7.50	3.75	2.37	3.00	3.15	1/4	
28-Feb. 3	7.25	3.75	2.37	3.00	3.20	5	
" 4-10	7.50	3.75	2.00	3.45	3.20	7	
" 11-17	7.50	3.75	2.00	3.12	3.13	8	
" 18-24	7.75	3.75	2.00	3.37	3.25	8	
" 25-Mar. 3	7.75	3.75	2.00	3.25	3.20	5	
" 4-10	7.75	3.75	2.00	3.50	3.17	3	
" 11-17	7.75	3.75	2.00	3.62	3.25	8	
" 18-24	7.50	3.75	2.50	3.45	3.26	1/2	
" 25-31	7.50	3.75	2.50	3.37	3.28	2	
Apr. 1-Apr. 7	7.50	3.75	2.50	3.25	3.30	2	
" 8-14	7.50	3.75	2.50	2.25	3.36	2	
" 15-21	7.50	3.75	1.50	2.50	3.20	6	
" 22-28	7.25	3.25	9.00	1.50	3.07	1/3	
29-May 5	7.50	3.50	4.00	2.00	3.08	1	
May 6-12	7.50	3.50	4.00	6.00	2.75	3	
" 13-19	7.50	3.50	4.00	6.00	2.71	4	
" 20-26	7.50	3.50	4.00	6.00	2.65	6	
27-June 2	7.50	3.50	8.00	7.50	2.52	1/3	
" 3-9	7.50	3.50	7.50	7.50	2.54	2	
" 10-16	7.50	3.50	7.50	7.50	2.45	2	
" 17-23	7.50	3.50	7.50	7.50	2.47	2	
" 24-30	7.50	3.50	7.50	7.50	2.47	2	
July 1-7	7.00	3.25	10.00	5.00	2.40	10	
July 8-9	2.25	7.50			2.30		

Refused hay for two weeks

Bred Dec. 27 to Muddler

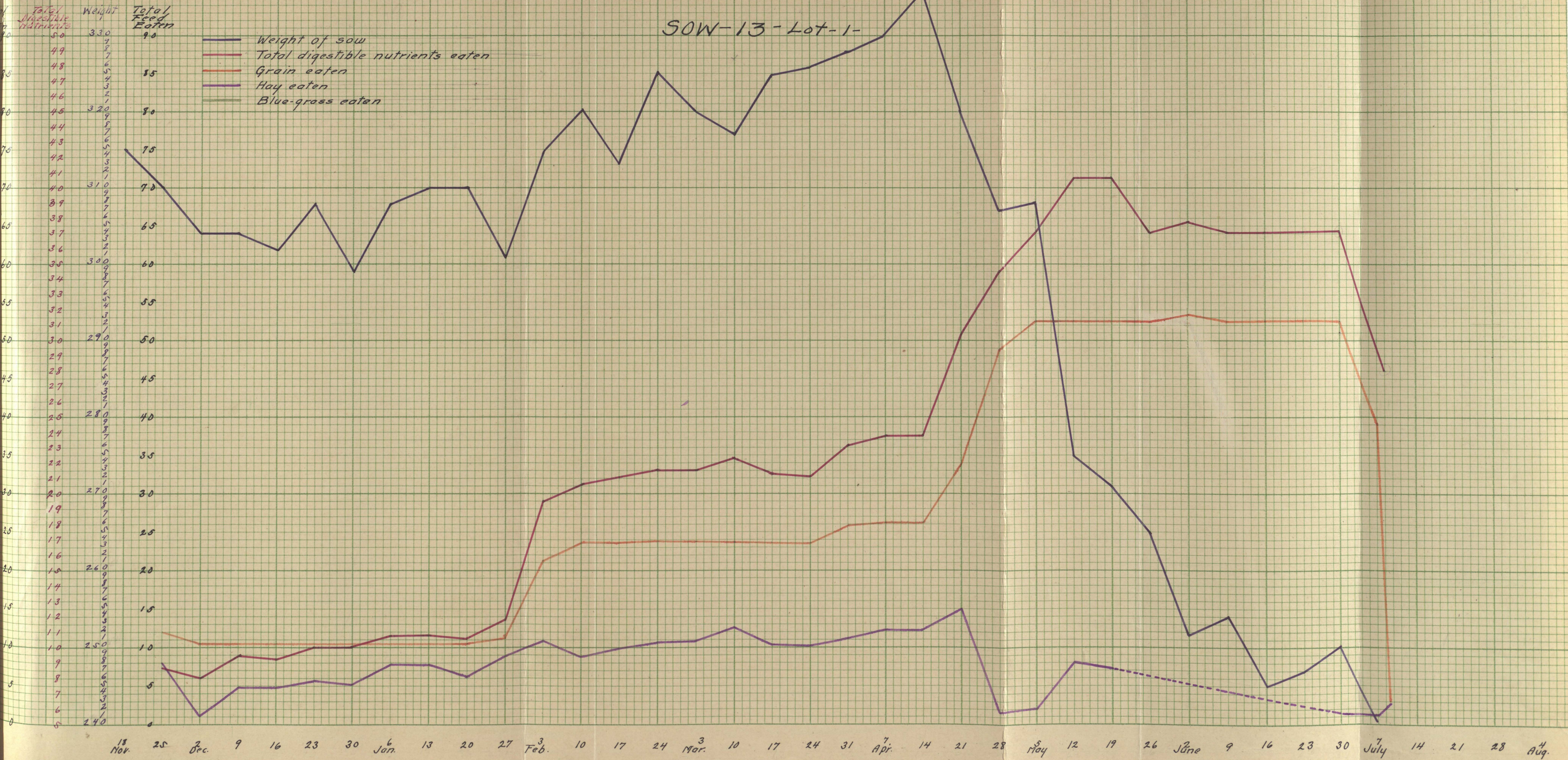
Farrowed April 21. 5 boys and 20 girls
6 pigs selling. Bred wgt. of boys 3-65 of
sows 410

June 14th moved house to hog house

Pigs weaned July 5
then immediately turned on grass
Bred of Muddler July 10

Date 1908	Protein	Nitrogen -Free- Extract	Ether Extract	Total Digestible Nutrients	Weight	Nutritive Ratio of Food-Eaten
Nov 18-1908	1.10	7.04	.46	8.60	315	7.4
" 26-Dec 2	1.07	6.50	.41	7.98	310	7.0
Dec 3- " 9	1.31	7.78	.47	9.56	304	6.8
" 10- " 16	1.12	7.73	.47	9.32	302	7.9
" 17- " 23	1.38	8.14	.49	10.01	308	6.8
" 24- " 30	1.41	8.28	.50	10.19	299	6.7
" 31-Jan. 6, 09	1.51	8.81	.52	10.84	308	6.7
Jan 7- " 13	1.51	8.81	.52	10.84	310	6.7
" 14- " 20	1.47	8.64	.51	10.62	310	6.7
" 21- " 27	1.65	9.60	.58	11.83	315	6.7
Feb 4- " 10	2.73	15.90	.99	19.62	315	6.7
" 11- " 17	2.88	16.72	1.06	20.64	310	6.7
" 18- " 24	2.95	17.13	1.06	21.14	313	6.6
" 25- " 31	3.02	17.45	1.08	21.55	325	6.6
Apr 1- " 7	3.02	17.45	1.08	21.55	320	6.6
" 8- " 14	3.28	19.48	1.20	23.96	330	6.8
" 15- " 21	4.17	24.48	1.53	30.49	336	6.9
" 22- " 28	4.56	28.10	1.84	34.50	320	6.8
" 29-May 5	4.91	30.27	1.97	37.15	308	7.1
May 6- " 12	5.44	33.06	2.11	40.61	275	7.0
" 13- " 19	5.44	33.06	2.11	40.61	271	7.0
" 20- " 26	4.90	30.07	1.97	37.07	265	7.1
" 27-June 2	4.99	30.74	2.02	37.75	265	7.1
June 3- " 9	4.90	30.20	1.97	37.07	254	7.1
" 10- " 16	4.90	30.20	1.97	37.07	245	7.1
" 17- " 23	4.90	30.20	1.97	37.07	247	7.1
" 24- " 30	4.90	30.20	1.97	37.07	247	7.1
July 1- " 7	3.71	22.80	1.49	28.07	240	7.1
" 8- " 14	3.71	22.80	1.49	28.07	230	7.1

SOW-13-Lot-1-



Lot 2

RECORD OF SOW - 20 -

Corn 2 prts. Shorts 1prt.
Clover hay ad Lib. Hum

Date	1908	Corn	Shorts	Clover	Refuse	Weight	Gain	Loss
Nov 19 -	18	8.50	3.50	7.00	4.25	24.50		12
" 26 -	Nov 25	7.00	3.50	5.50	4.00	23.30		
Dec 3 -	Dec 9	7.00	3.50	6.00	1.44	24.70	6	
" 10 -	" 16	7.00	3.50	8.00	2.82	24.00		7
" 17 -	" 23	7.00	3.50	8.50	1.75	22.20		18
" 24 -	" 30	7.00	3.50	1.00	2.13	22.30	1	
" 31 -	Jan. 6 1899	7.00	3.50	1.00	1.75	23.40		10
Jan 7 -	" 13	7.00	3.50	1.00	5.25	22.80		
" 14 -	" 20	7.00	3.75	1.50	7.25	22.50	22	
" 21 -	" 27	7.75	2.00	3.00	4.00	23.00		20
Feb. 4 -	Feb 10	19.25	8.75	7.50	7.25	23.00		4
" 11 -	" 12	5.50	2.50	5.00	4.50	23.00		6
" 13 -	" 17	13.75	6.25	1.25	13.00	22.60		4
" 18 -	" 24	38.50	17.50	7.50	14.00	22.60		20
" 25 -	Mar. 3	48.25	24.00	7.50	13.25	23.00		4
Mar. 4 -	" 10	49.00	24.50	7.50	16.25	23.00		6
" 11 -	" 17	49.00	24.50	7.50	16.25	22.40		6
" 18 -	" 24	49.00	24.50	7.50	12.25	22.50		2
" 25 -	" 31	49.00	24.50	7.50	12.50	22.50		10
Apr. 1 -	Apr. 7	49.00	24.50	7.00	6.75	22.15		2
Apr. 8 -	" 14	44.50	21.25	7.00	9.00	22.20		19
" 15 -	" 21	49.00	24.50	3.00	11.25	22.20		2
" 22 -	" 28	49.00	24.50	1.35	4.00	22.25		19
" 29 -	May 5	49.00	24.50	1.40	4.00	23.00		2
May 6 -	May 12	49.00	24.50	1.40	4.00	23.00		19
" 13 -	" 19	43.50	19.00	4.00	14.00	23.00		2
" 20 -	" 26	21.00	10.50	7.00	11.25	22.25		19
" 27 -	June 2	21.00	10.50	7.00	11.25	23.70		2
June 3 -	" 9	21.00	10.50	1.00	18.50	23.50		2
" 10 -	" 16	24.50	8.75	2.35	24.00	24.00		5
" 17 -	" 23	22.50	8.75	3.00	5.25	22.55		13
" 24 -	" 30	17.50	8.75	3.00	9.25	22.40		1
July 1 -	July 7	17.50	8.75	3.00	9.25	22.40		1
July 8 -	July 14	12.50	6.25	3.00	18.50	22.40		1
" 15 -	" 21	3.50	1.75	3.00	2.75	22.50		1
" 22 -	" 28	3.50	1.75	3.00	2.75	22.50		1
" 29 -	Aug. 4	3.50	1.75	4.20	2.00	22.40		1
Aug. 5 -	" 11	3.50	1.75	4.50	2.00	22.50		1
" 12 -	" 18	3.50	1.75	2.60	2.50	22.30		1
" 19 -	" 25	3.50	1.75	3.90	1.60	22.40		1
Sept. 1 -	Sept. 8	3.50	1.75	6.50	2.50	23.90		1
Sept. 2 -	" 15	3.50	1.75	4.00	2.40	23.50		1
" 9 -	" 15	3.50	1.75	4.00	2.40	23.50		1
" 16 -	" 22	3.50	1.75	4.00	2.40	23.00		1
" 23 -	" 29	3.50	1.75	4.00	2.40	22.80		1
Oct. 7 -	" 13	3.50	1.75	4.00	2.40	22.50		1
" 14 -	" 20	3.50	1.75	4.00	2.40	22.50		1
" 21 -	" 27	6.00	3.00	4.00	1.50	22.20		1
" 28 -	Nov. 3	7.00	3.50	4.00	1.90	22.20		1
Nov. 4 -	Nov. 10	10.00	5.00	4.00	2.35	22.30		1
Nov. 11 -	" 17	10.50	5.25	4.00	2.50	22.20		1
" 18 -	" 24	10.50	5.25	4.00	2.90	22.20		1
" 25 -	Dec. 1	10.50	5.25	4.00	1.70	22.20		1
Dec. 2 -	" 8	10.50	5.25	4.00	1.70	22.30		1
Dec. 9 -	" 15	10.50	5.25	4.00	3.00	22.40		1
" 16 -	" 22	10.50	5.25	4.00	3.00	22.40		1
" 23 -	" 29	10.50	5.25	3.50	3.50	22.50		1
Jan 5 -	Jan 12	10.50	5.25	4.00	2.90	22.50		1
Jan 6 -	" 19	10.50	5.25	4.00	2.90	23.00		1
" 13 -	" 26	10.50	5.25	4.00	2.30	22.50		1
" 20 -	Feb. 2	10.50	5.25	4.00	2.60	22.50		1
" 27 -	Feb. 9	10.50	5.25	4.00	2.60	22.50		1
" 3 -	" 16	10.50	5.25	4.00	2.40	22.60		1
" 10 -	" 23	10.50	5.25	4.00	2.40	22.60		1
" 17 -	Mar. 2	10.50	5.25	4.00	2.40	22.60		1
" 24 -	Mar. 9	10.50	5.25	4.00	2.40	22.60		1
" 31 -	Apr. 6	10.50	5.25	4.00	2.40	22.60		1

Farrowed Feb. 12. 7 pigs, 4 boars + 3 sows
 3 sows of boars Feb. 16 2 pigs died.
 Birth wt of boars Feb. 4. Feb. 24, 4 pigs
 sows 3-0. Feb. 24, 4 pigs
 Feb. 26. 1 sow pig laid upon 3 pigs

Changed to blue grass May 20.
 Pigs weaned May 20 and sow
 taken to hog barn.

changed to clover Sep. 2

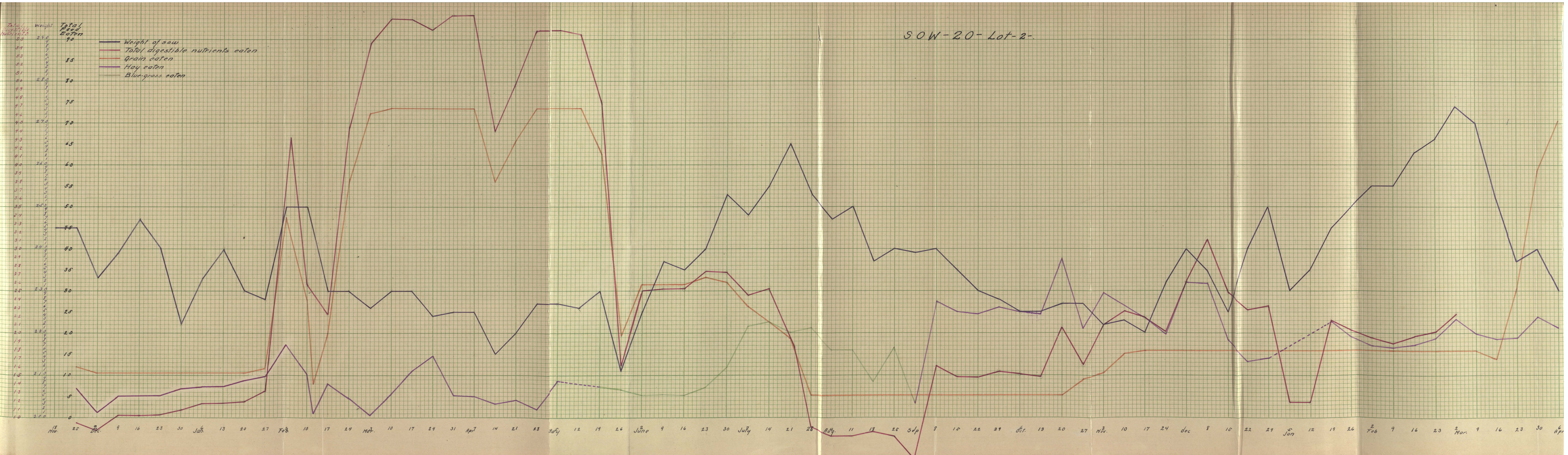
Nov 17 Bred to Meddler

Date - 1908	Protein	Nitrogen Free Extract	Ether Extract	Total digestible Nutrients	Weight
Nov 18 - Nov 25	1.12	7.538	.49	9.14	24.5
" 19 - Nov 25	1.01	6.98	.42	8.41	24.5
Dec 3 - Dec 9	1.34	8.32	.50	10.16	23.3
" 10 - " 16	1.34	8.32	.50	10.16	24.7
" 17 - " 23	1.35	8.38	.51	10.24	24.0
" 24 - " 30	1.46	8.90	.54	10.95	22.4
" 31 - Jan 6 09	1.55	9.53	.56	11.66	23.3
Jan 7 - " 13	1.57	9.53	.56	11.66	24.0
" 14 - " 20	1.60	9.66	.57	11.83	22.8
" 21 - Feb 3	1.75	10.65	.63	13.03	22.5
Feb 4 - " 10	1.99	11.6	.71	15.79	22.0
" 11 - " 17	3.34	15.5	1.33	25.79	25.0
" 18 - " 24	2.49	15.36	.94	24.66	23.0
" 25 - Mar 3	4.59	26.56	2.34	44.49	23.0
Mar 4 - " 10	6.88	44.90	2.89	54.67	22.6
" 11 - " 17	7.30	47.18	3.01	57.49	22.0
" 18 - " 24	7.10	46.11	2.90	56.11	22.0
" 25 - Apr 1	7.37	47.54	3.03	57.94	22.5
Apr 2 - Apr 8	7.48	47.18	3.03	57.94	21.5
" 9 - " 14	6.24	42.94	2.66	51.98	22.2
" 15 - " 21	7.07	46.02	2.99	60.5	22.2
" 22 - May 5	7.01	46.66	2.94	60.5	22.2
" 6 - " 12	7.01	46.66	2.94	60.5	22.2
" 13 - " 19	7.01	46.66	2.94	60.5	22.2
" 20 - " 26	7.01	46.66	2.94	60.5	22.2
" 27 - June 2	7.01	46.66	2.94	60.5	22.2
June 3 - " 9	7.01	46.66	2.94	60.5	22.2
" 10 - " 16	7.01	46.66	2.94	60.5	22.2
" 17 - " 23	7.01	46.66	2.94	60.5	22.2
" 24 - July 7	7.01	46.66	2.94	60.5	22.2
July 8 - " 14	7.01	46.66	2.94	60.5	22.2
" 15 - " 21	7.01	46.66	2.94	60.5	22.2
" 22 - " 28	7.01	46.66	2.94	60.5	22.2
" 29 - Aug 4	7.01	46.66	2.94	60.5	22.2
Aug 5 - " 11	7.01	46.66	2.94	60.5	22.2
" 12 - " 18	7.01	46.66	2.94	60.5	22.2
" 19 - " 25	7.01	46.66	2.94	60.5	22.2
" 26 - Sep 1	7.01	46.66	2.94	60.5	22.2
Sep 2 - " 8	7.01	46.66	2.94	60.5	22.2
" 9 - " 15	7.01	46.66	2.94	60.5	22.2
" 16 - " 22	7.01	46.66	2.94	60.5	22.2
" 23 - " 29	7.01	46.66	2.94	60.5	22.2
Oct 30 - Oct 6	7.01	46.66	2.94	60.5	22.2
Oct 7 - " 13	7.01	46.66	2.94	60.5	22.2
" 14 - " 20	7.01	46.66	2.94	60.5	22.2
" 21 - " 27	7.01	46.66	2.94	60.5	22.2
" 28 - Nov 3	7.01	46.66	2.94	60.5	22.2
Nov 4 - " 10	7.01	46.66	2.94	60.5	22.2
" 11 - " 17	7.01	46.66	2.94	60.5	22.2
" 18 - Dec 1	7.01	46.66	2.94	60.5	22.2
" 25 - Dec 8	7.01	46.66	2.94	60.5	22.2
Dec 9 - " 15	7.01	46.66	2.94	60.5	22.2
" 22 - " 28	7.01	46.66	2.94	60.5	22.2
Jan 5 - Jan 12	7.01	46.66	2.94	60.5	22.2
" 13 - " 19	7.01	46.66	2.94	60.5	22.2
" 20 - " 26	7.01	46.66	2.94	60.5	22.2
Feb 27 - Feb 9	7.01	46.66	2.94	60.5	22.2
Feb 3 - " 9	7.01	46.66	2.94	60.5	22.2
" 8 - " 16	7.01	46.66	2.94	60.5	22.2
" 17 - " 23	7.01	46.66	2.94	60.5	22.2
" 24 - Mar 2	7.01	46.66	2.94	60.5	22.2

SOW-20-Lot-2-

Weight
Total
Eaten

— Weight of sow
— Total digestible nutrients eaten
— Grain eaten
— Hay eaten
— Blue-grass eaten



Corn 2 prts. Shorts 1 prt
Clover hay ad libitum

Date	1908	Corn	Shorts	Clover	Refuse	Weight	Gain	Loss
Nov. 18	Nov. 25	8.50	3.50	7.50	4.25	3.15	5	
" 26	Dec. 2	7.00	3.50	5.50	4.00	3.13		22
" 10	" 16	7.00	3.50	6.50	1.44	3.17	6	
" 24	" 30	7.00	3.50	8.00	2.82	3.20	3	
" 31	Jan. 6, 09	7.00	3.50	8.50	1.75	3.12	2	10
Jan. 14	" 13	7.00	3.50	10.50	1.21	3.05	15	7
" 21	" 27	7.75	3.75	15.00	1.75	3.18		28
" 28	Feb. 3	12.25	5.25	17.00	1.25	3.10		5
Feb. 4	" 10	16.50	4.50	15.00	6.50	3.05	14	
" 11	" 17	19.25	5.25	17.50	7.25	3.19	12	
" 18	" 24	19.25	5.25	17.50	6.50	3.31	9	
" 25	" 31	14.00	7.00	12.50	7.75	3.55	11	
Apr. 1	Apr. 7	14.00	7.00	12.50	2.50	3.57	5	7
" 8	" 12	12.00	5.00	5.00	3.00	3.47		8
" 13	" 21	21	7.00	7.00	7.00	3.35	3	20
" 22	" 28	28	7.00	7.00	1.50	3.31	3	
May 6	May 12	14.00	8.75	7.00	7.00	3.37	6	
" 13	" 19	14.00	8.75	8.75	8.00	3.21	1	
" 20	" 26	14.00	8.75	7.00	1.50	3.28	5	
" 27	June 2	14.00	8.75	7.00	.87	3.31	3	
June 3	" 9	14.00	7.00	7.00		3.37	6	
" 10	" 16	14.00	7.00	10.50	7.00	3.37	1	
" 17	" 23	22.25	5.25	14.00	5.75	3.38	6	
" 24	" 30	22.25	5.25	14.00	8.00	3.23	3	
July 1	July 7	10.50	5.25	3.15	7.50	3.28	5	
" 8	July 14	10.50	5.25	3.15	5.50	3.40	3	
" 15	" 21	6.50	4.25	4.05	9.25	3.46	4	
" 22	" 28	3.50	1.75	5.50	8.75	3.45	4	
" 29	Aug. 4	3.50	1.75	5.50	2.25	3.44	5	
Aug. 5	" 11	3.50	1.75	6.00	1.90	3.40	7	
" 12	" 18	3.50	1.75	3.20	3.75	3.39	3	
" 19	" 25	3.50	1.75	4.80	3.75	3.40	7	
Sept. 2	Sept. 8	3.50	1.75	8.00	5.75	3.35	5	
" 9	" 15	3.50	1.75	6.00	2.50	3.22	10	
" 16	" 22	3.50	1.75	6.00	2.42	3.23	2	
" 23	" 29	3.50	1.75	6.00	2.72	3.22	2	
Oct. 30	Oct. 6	3.50	1.75	6.00	2.72	3.12	13	
Oct. 7	" 13	3.50	1.75	6.00	2.62	3.07	12	
" 14	" 20	3.50	1.75	6.00	2.50	2.97	13	
" 21	" 27	3.50	1.75	6.00	3.80	2.89	8	
Nov. 28	Nov. 3	6.00	3.00	9.00	2.50	2.77	12	
Nov. 4	" 10	6.00	3.00	8.00	2.70	2.76	1	
" 11	" 17	6.00	3.00	6.00	2.87	2.80	5	
" 18	" 24	8.50	4.75	6.00	4.00	2.75	4	
" 25	Dec. 1	10.50	5.50	6.00	4.50	2.79	6	
Dec. 2	" 8	22.75	11.75	6.00	6.00	2.73	22	
" 9	" 15	3.50	1.75	6.00	3.22	2.85	25	
" 16	" 22	3.50	1.75	6.00	3.37	2.95	5	
" 23	" 29	3.70	1.85	4.80	3.37	3.10	10	
Jan. 30	Jan. 5, 1910	3.85	1.92	4.80	2.20	3.15	5	
Jan. 6	" 12	29.50	4.75	3.50	4.25	3.15	5	
" 13	" 19	25.00	1.25	3.50	4.25	3.15	5	
" 20	" 26	1.00	1.05	3.50	1.80	3.25	10	
" 27	Feb. 2	4.00	7.00	3.50	2.40	3.10	3	
" 3	" 9	4.00	7.00	3.50	2.40	3.20	3	
" 10	" 16	7.00	3.50	4.20	2.75	3.15	5	
" 17	" 23	7.00	3.50	4.20	2.75	3.15	3	
" 24	" 30	7.00	3.50	4.20	2.75	3.15	2	
Apr. 6	Apr. 6	4.00	3.00	23.00	1.32	3.15	10	

Dec. 24, bred to Meddler

Jan. 27 moved to Barn.

Apr. 13 Farrowed 9 pigs, all dead when born. No record kept. From Apr. 13 to 27 formed on grass to recover Birth wt. of boars 2'-2"

changed to bleggrass May 20 June 8 Bred to Ornament

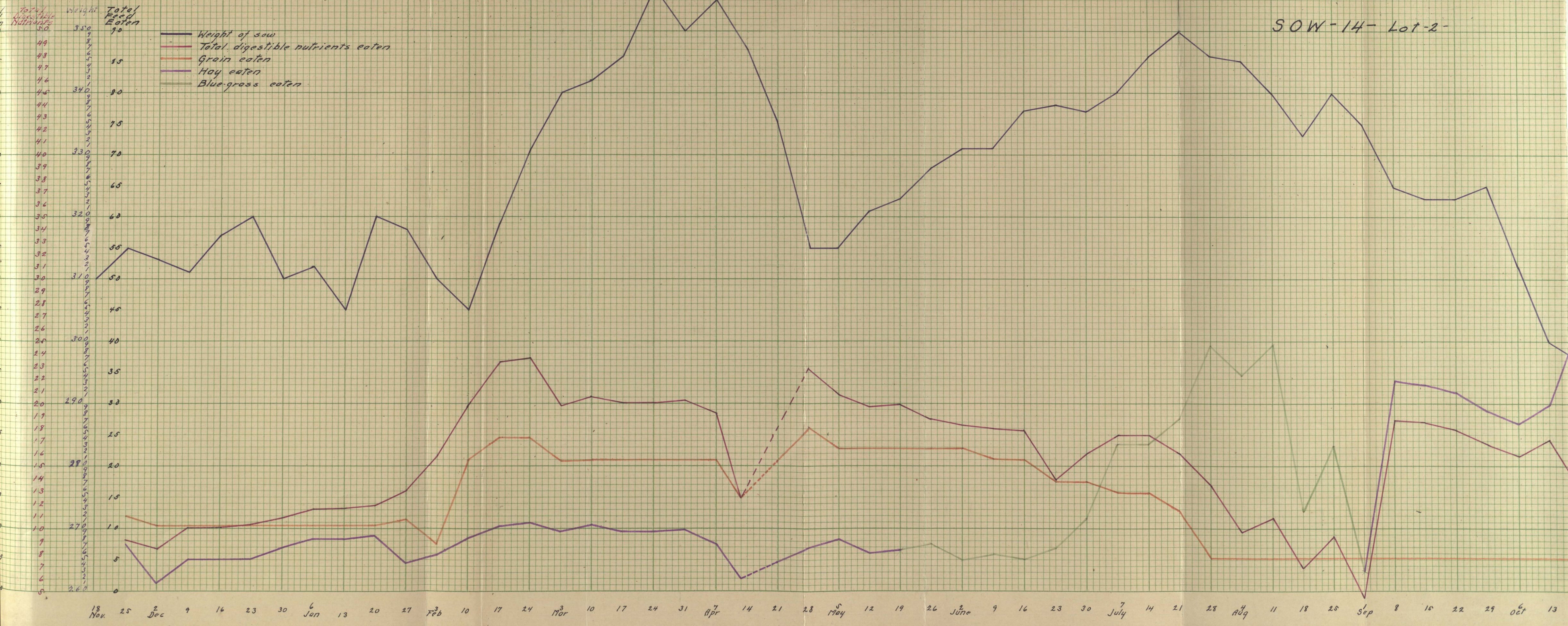
Changed to Clover Sept 2

Oct. 2. 09 farrowed 1 Boar, 1 Sow Birth wt. of boars 2'-4"

Wearred Dec. 9,

Date 1908	Protein	Nitrogen Free Extract	Ether Extract	Total Digestible Nutrients	Weight
Nov. 18					
" 18 - Nov 25	1.12	7.53	.42	9.14	3/15
" 26 - Dec 2	1.01	6.98	.50	8.41	3/13
Dec 3 - " 9	1.34	8.32	.50	10.16	3/17
" 10 - " 16	1.34	8.32	.50	10.16	3/20
" 17 - " 23	1.35	8.38	.51	10.24	3/20
" 24 - " 30	1.46	8.95	.54	10.95	3/12
" 31 - Jan 6/09	1.57	9.53	.56	11.66	3/12
Jan 7 - " 13	1.57	9.53	.56	11.66	3/10
" 14 - " 20	1.60	9.66	.57	11.83	3/20
" 21 - " 27	1.75	10.65	.63	13.03	3/10
" 28 - Feb 3	2.02	12.98	.81	15.81	3/10
Feb 4 - " 10	2.46	16.43	1.01	19.90	3/5
" 11 - " 17	2.89	19.29	1.18	23.36	3/19
" 18 - " 24	3.94	25.56	1.20	28.70	3/3
" 25 - Mar 3	3.62	23.32	.99	27.93	3/4
Mar 4 - " 10	2.72	16.81	1.01	20.54	3/4
" 11 - " 17	2.66	16.45	1.00	20.11	3/4
" 18 - " 24	2.66	16.45	1.00	20.11	3/7
" 25 - " 31	2.67	16.54	1.01	20.22	3/5
Apr 1 - Apr 7	2.52	15.74	.97	19.23	3/5
" 8 - " 12	1.57	10.04	.63	12.24	3/4
" 13 - " 21					3/5
" 22 - " 28	2.98	18.82	1.17	22.97	3/5
" 29 - May 5	2.79	16.93	1.04	20.76	3/5
May 6 - " 12	2.64	16.13	1.00	19.77	3/15
" 13 - " 19	2.67	16.31	1.01	19.99	3/23
" 20 - " 26	2.45	15.45	.96	18.86	3/28
" 27 - June 2	2.38	14.95	.94	18.27	3/31
June 3 - " 9	2.40	15.12	.95	18.47	3/31
" 10 - " 16	2.38	14.98	.94	18.30	3/31
" 17 - " 23	1.84	12.28	.76	14.88	3/38
" 24 - " 30	1.98	13.21	.80	15.99	3/37
July 1 - July 7	2.30	14.42	.82	17.44	3/40
" 8 - " 14	2.20	14.42	.82	17.44	3/46
" 15 - " 21	2.14	13.10	.71	15.95	3/50
" 22 - " 28	1.68	10.03	.52	13.23	3/46
" 29 - Aug 4	1.23	8.11	.41	9.75	3/45
Aug 5 - " 11	1.38	9.07	.45	10.90	3/40
" 12 - " 18	1.88	11.78	.31	16.97	3/33
" 19 - " 25	1.20	7.84	.40	9.44	3/40
" 26 - Sep 1	1.59	10.88	.24	14.71	3/5
Sep 2 - " 8	2.78	15.25	.77	18.80	3/5
" 9 - " 15	2.74	15.07	.77	18.58	3/23
" 16 - " 22	2.66	14.63	.75	17.98	3/23
" 23 - " 29	2.45	13.55	.70	16.70	3/25
" 30 - Oct 6	2.32	12.84	.67	15.83	3/12
Oct 7 - " 13	2.52	13.91	.72	17.15	3/00
" 14 - " 20	1.88	10.51	.55	12.94	2/9
" 21 - " 27	1.88	10.51	.55	12.94	2/7
" 28 - Nov 3	3.19	18.12	.96	22.27	2/9
Nov 4 - " 10	3.05	18.77	1.08	22.83	2/16
" 11 - " 17	4.32	25.77	1.49	31.58	2/8
" 18 - " 24	4.27	25.62	1.45	31.38	2/7
" 25 - Dec 1	5.82	34.44	1.97	43.33	2/9
Dec 2 - " 8	6.40	38.66	2.26	47.31	2/3
" 9 - " 15	7.49	45.75	2.72	55.96	2/9
" 16 - " 22	6.55	40.76	2.49	49.80	2/8
" 23 - " 29	7.18	44.41	2.69	54.28	2/10
" 30 - Jan 5 '08	5.50	35.89	2.31	43.70	3/5
Jan 6 - " 12	4.32	27.50	1.77	33.49	3/10
" 13 - " 19	4.98	30.72	1.85	37.55	3/5
" 20 - " 26	3.90	24.32	1.49	29.71	3/25
" 27 - Feb 2	3.16	19.14	1.13	23.43	3/10
Feb 3 - " 9	2.76	16.99	1.03	20.78	3/20
" 10 - " 16	2.40	14.52	.86	17.78	3/23
" 17 - " 23	2.48	14.82	.85	18.15	3/20
" 24 - Mar 2	2.35	14.07	.80	17.22	3/25

SOW-14-Lot-2-



Total
Weight
Adrian



Date	1908	Corn	Tankage	Claver	Refuse	Weight	Gain	Loss
Nov 18 -	Nov 25	1.10	.85	7.00	4.60	27.9	3	6
" 26 -	Dec 2	9.63	.88	5.50	2.10	28.2		1
Dec 3 -	" 9	9.63	.88	5.50	1.87	29.3	12	
" 10 -	" 16	9.63	.88	7.75	3.25	29.8	5	
" 17 -	" 23	9.63	.88	8.50	3.60	29.1	14	7
" 24 -	" 30	9.63	.88	10.50	3.00	30.4	7	1
" 31 -	Jan 6, 09	9.63	.88	10.50	8.75	29.7	7	9
Jan 7 -	" 13	10.50	.88	10.50	9.25	29.7	7	5
" 14 -	" 20	10.50	.88	18.00	7.75	29.5	4	2
" 21 -	" 27	10.50	.88	17.50	8.75	29.9	4	
" 28 -	Feb 3	10.50	.88	17.50	7.50	30.0	4	
Feb 4 -	" 10	10.50	.88	17.50	6.25	30.4	1	
" 11 -	" 17	10.50	.88	17.50	4.00	31.5		
" 18 -	" 24	10.50	.88	17.50	8.50	27.1		24
" 25 -	Mar 3	10.50	.88	17.50	1.75	26.5		21
Mar 4 -	" 10	10.50	.88	17.50	8.50	26.5		5
" 11 -	" 13	10.50	.88	17.50	4.75	27.4		
" 14 -	" 17	10.50	.88	17.50	2.60	26.0		14
" 18 -	" 24	10.50	.88	17.50	2.40	24.7		13
" 25 -	" 31	10.50	.88	17.50	2.60	26.5		7
Apr 1 -	Apr 7	10.50	.88	17.50	1.35	26.5		
Apr 8 -	Apr 14	10.50	.88	17.50	8.50	26.6		
" 15 -	" 21	10.50	.88	17.50	4.75	27.4		
" 22 -	" 28	10.50	.88	17.50	2.60	26.0		
" 29 -	May 5	10.50	.88	17.50	2.40	24.7		
May 6 -	May 12	10.50	.88	17.50	2.60	26.5		
" 13 -	" 19	10.50	.88	17.50	2.60	26.5		
" 20 -	" 26	10.50	.88	17.50	2.60	26.5		
" 27 -	June 2	10.50	.88	17.50	2.60	26.5		
June 3 -	June 9	10.50	.88	17.50	2.60	26.5		
" 10 -	" 16	10.50	.88	17.50	2.60	26.5		
" 17 -	" 23	10.50	.88	17.50	2.60	26.5		
" 24 -	" 30	10.50	.88	17.50	2.60	26.5		
July 1 -	July 7	10.50	.88	17.50	2.60	26.5		
" 9 -	" 14	10.50	.88	17.50	2.60	26.5		
" 15 -	" 21	10.50	.88	17.50	2.60	26.5		
" 22 -	" 28	10.50	.88	17.50	2.60	26.5		
" 29 -	Aug 4	10.50	.88	17.50	2.60	26.5		
Aug 5 -	" 11	10.50	.88	17.50	2.60	26.5		
" 12 -	" 18	10.50	.88	17.50	2.60	26.5		
" 19 -	" 25	10.50	.88	17.50	2.60	26.5		
" 26 -	Sep 1	10.50	.88	17.50	2.60	26.5		
Sep 2 -	" 8	10.50	.88	17.50	2.60	26.5		
" 9 -	" 15	10.50	.88	17.50	2.60	26.5		
" 16 -	" 22	10.50	.88	17.50	2.60	26.5		
" 23 -	" 29	10.50	.88	17.50	2.60	26.5		
" 30 -	Oct 6	10.50	.88	17.50	2.60	26.5		
Oct 7 -	" 13	10.50	.88	17.50	2.60	26.5		
" 14 -	" 20	10.50	.88	17.50	2.60	26.5		
" 21 -	" 27	10.50	.88	17.50	2.60	26.5		
" 28 -	Nov 3	10.50	.88	17.50	2.60	26.5		
Nov 4 -	" 10	10.50	.88	17.50	2.60	26.5		
" 11 -	" 17	10.50	.88	17.50	2.60	26.5		
" 18 -	" 24	10.50	.88	17.50	2.60	26.5		
" 25 -	Dec 1	10.50	.88	17.50	2.60	26.5		
" 29 -	" 8	10.50	.88	17.50	2.60	26.5		
" 30 -	" 15	10.50	.88	17.50	2.60	26.5		
Jan 6 -	Jan 12	10.50	.88	17.50	2.60	26.5		
" 13 -	" 19	10.50	.88	17.50	2.60	26.5		
" 20 -	" 26	10.50	.88	17.50	2.60	26.5		
" 27 -	Feb 2	10.50	.88	17.50	2.60	26.5		
" 3 -	Feb 9	10.50	.88	17.50	2.60	26.5		
" 10 -	" 16	10.50	.88	17.50	2.60	26.5		
" 17 -	" 23	10.50	.88	17.50	2.60	26.5		
" 24 -	" 30	10.50	.88	17.50	2.60	26.5		
" 31 -	Apr 6	10.50	.88	17.50	2.60	26.5		

Tankage
Claver
Refuse
Weight
Gain
Loss

Bred to Meddler Nov. 20.

Farrowed March 14 2 boars & 8 sows
Palpe Birth wt. boars. 2'12"
" " " sows 2'4"

Taken from hog barn and put in lot
West of barn

Weaned June 9 pigs. On thrifty
changed to bluegrass June 17 hog

Changed to Claver Sep. 2, 09.

Bred Jan. 8, 1910

	Protein	Nitrogen-free Extract	Ether Extract	Total	Weight
Nov 19-Nov 25	1.35	7.34	.7	9.16	28.5
" 26-Dec. 2	1.31	6.78	.43	8.52	27.9
Dec 3-Dec. 9	1.47	7.64	.47	9.58	28.2
" 10-" 16	1.56	8.08	.49	10.13	29.3
" 17-" 23	1.61	8.08	.49	10.13	29.8
" 24-" 30	1.71	8.39	.50	10.50	29.1
" 31-Jan. 6, 04	1.71	8.89	.53	11.13	29.0
Jan. 7-" 13	1.43	7.63	.48	9.54	30.4
" 14-" 20	3.83	1.85	1.15	2.35	29.5
" 21-" 27	2.77	1.36	.83	2.24	29.7
" 28-Feb. 3	1.94	9.60	.57	2.11	29.5
Feb. 4-" 10	2.29	1.30	.68	1.42	29.9
" 11-" 17	2.37	1.17	.70	1.48	30.0
" 18-" 24	2.46	1.22	.72	1.53	30.4
" 25-Mar. 3	2.18	1.07	.65	1.36	31.5
" 4-" 10	2.18	1.07	.65	1.36	31.5
" 11-" 13	1.31	5.54	.35	7.20	29.1
" 14-" 17	3.66	7.47	1.08	2.14	27.0
" 18-" 24	4.37	1.30	.70	1.48	29.9
" 25-Mar. 3	4.83	1.22	.72	1.53	30.0
" 4-" 10	4.27	1.22	.72	1.53	30.4
" 11-" 13	3.62	1.07	.65	1.36	31.5
" 14-" 17	3.62	1.07	.65	1.36	31.5
" 18-" 24	5.17	2.76	1.78	3.46	24.7
" 25-Mar. 3	5.67	3.16	2.04	3.99	24.0
" 31-Apr. 7	5.79	3.26	2.11	4.08	26.0
Apr. 8-Apr. 14	6.34	3.43	2.21	4.23	26.7
" 15-" 21	6.87	3.73	2.41	4.61	27.3
" 22-" 28	6.34	3.73	2.41	4.61	27.3
" 29-May 5	5.67	3.16	2.04	3.99	24.0
May 6-" 12	5.83	3.73	2.41	4.61	27.3
" 13-" 19	5.83	3.73	2.41	4.61	27.3
" 20-" 26	6.34	3.73	2.41	4.61	27.3
" 27-June 2	6.87	3.73	2.41	4.61	27.3
June 3-" 9	5.87	3.30	2.13	4.10	29.5
" 10-" 16	2.06	1.03	.72	1.36	30.7
" 17-" 23	2.48	1.42	.84	1.75	29.5
" 24-" 30	2.70	1.55	.91	1.92	29.1
July 1-July 7	2.66	1.53	.90	1.89	30.0
" 8-" 14	2.64	1.43	.80	1.77	29.5
" 15-" 21	2.55	1.36	.78	1.70	29.5
" 22-" 28	1.89	1.39	.48	1.27	30.0
Aug. 5-" 11	1.90	1.41	.43	1.23	28.8
" 12-" 18	1.19	1.78	.25	1.93	28.4
" 19-" 25	1.19	1.78	.25	1.93	28.4
26-Sep. 8	1.63	3.02	.31	2.94	29.0
" 9-" 15	2.30	1.65	.71	3.82	30.7
" 16-" 22	2.29	1.39	.58	2.22	28.5
" 23-" 29	2.30	1.57	.59	2.44	28.0
30-Oct. 6	2.00	1.65	.59	2.44	27.8
Oct. 7-" 13	2.25	1.00	.51	1.25	27.6
" 14-" 20	3.12	1.39	.58	1.22	27.5
" 21-" 27	1.62	1.59	.79	1.98	27.5
" 28-Nov. 3	2.44	1.08	.42	1.01	27.5
Nov. 4-" 10	2.86	1.39	.63	1.54	27.0
" 11-" 17	2.20	1.54	.81	1.91	27.0
" 18-" 24	2.30	1.21	.65	1.49	27.0
" 25-Dec. 1	2.69	2.10	.65	1.49	27.0
Dec. 2-" 8	3.44	1.68	.78	1.81	27.0
" 9-" 15	2.46	1.86	.96	2.30	26.5
" 16-" 22	2.26	1.30	.74	1.62	26.0
" 23-" 29	2.26	1.30	.74	1.62	26.0
30-Jan. 5, 10	1.31	7.00	.45	8.58	26.0
Jan. 6-" 12	1.72	8.67	.56	10.95	25.8
" 13-" 19	3.03	6.78	.98	20.92	25.0
" 20-" 26	2.93	1.60	.98	20.60	26.8
" 27-Feb. 2	3.00	1.60	.98	19.95	26.5
Feb. 3-" 9	4.12	1.71	1.05	1.21	26.8
" 10-" 16	3.34	2.36	1.45	2.25	27.0
" 17-" 23	3.98	1.82	1.06	2.26	26.8
" 24-Mar. 2	3.98	2.11	1.24	2.44	28.0

SOW-31-Lot-3-



Lot 3

RECORD SOW-I-

Tankage
Clover hay ad libitum.

Date 1908	Corn	Tankage	Clover	Refuse	Weight	Gain	Loss
Nov 18 - Nov 25	1.11	88	700	460	2271	16	
" 26 - Dec 2	9.63	88	550	210	2278	7	
Dec 3 - " 9	9.63	88	550	187	2278		4
" 10 - " 16	9.63	88	650	325	2274		2
" 17 - " 23	9.63	88	775	300	2258		14
" 24 - " 30	9.63	88	850	360	2265		
" 31 - Jan 6, 1909	9.63	88	1050	360	2265		
Jan 7 - " 10	5.50	219	600	875	235		30
" 11 - " 20	23.60	219	1400	775	232		3
" 21 - " 27	23.50	219	1400	775	2345		
" 28 - Feb 3	23.50	219	1400	625	2245		2
Feb 4 - " 10	4.55	350	2800	675	2254		
" 11 - " 17	4.55	350	2800	650	2252		
" 18 - " 24	4.22	325	2800	875	2252		
" 25 - March 3	5.25	431	1400	1000	2263		
March 4 - " 10	5.60	438	1400	925	2272		
" 11 - " 17	5.60	438	1400	925	2279		
" 18 - " 24	5.60	438	1400	1025	2286		
" 25 - " 31	5.60	438	1400	1075	2295		
Apr 1 - Apr 7	5.60	438	1400	950	2310		
Apr 8 - " 14	4.80	406	500	350	310		
" 15 - " 21	4.80	375	600	300	325		
" 22 - " 28	4.00	131	700	550	305		
" 29 - May 5	4.00	131	1400	825	294		
May 6 - " 12	4.00	131	1400	825	294		
May 13 - " 14	4.00	131	1400	825	294		
" 15 - " 19	8.50	69	300	137	298		
" 20 - " 26	4.00	131	700	200	298		
" 27 - June 2	4.00	131	700	200	298		
June 3 - " 9	14.00	131	200	137	298		
" 10 - " 16	14.00	131	1750	200	293		
" 17 - " 23	14.00	131	2400	1825	306		
" 24 - " 30	14.50	88	3300	1775	300		
July 1 - July 7	8.75	88	3000	600	309		
" 8 - " 14	8.75	88	3000	575	313		
" 15 - " 21	6.50	88	3850	275	306		
" 22 - " 28	3.50	44	4500	250	306		
" 29 - Aug 4	3.50	44	4900	250	304		
Aug 5 - " 11	3.50	44	4900	1825	296		
" 12 - " 18	3.50	44	2800	1775	296		
" 19 - " 25	3.50	44	2800	1800	296		
" 26 - Sep 1	3.50	44	5600	2295	300		
Sep 2 - " 8	3.50	44	600	255	307		
Sep 9 - " 15	3.50	44	600	265	306		
" 16 - " 22	3.50	44	5600	2725	306		
" 23 - " 29	3.50	44	5600	2975	300		
Oct 1 - " 13	3.50	44	5600	2950	300		
" 14 - " 20	3.50	44	5600	2825	260		40
" 21 - " 27	3.50	44	5600	2150	257		9
Nov 3 - " 10	6.00	44	4800	2150	237		14
Nov 11 - " 17	1.00	199	4900	2800	225		7
Nov 18 - " 24	2.80	250	4900	2800	220		5
Dec 1 - " 8	3.15	263	4800	2800	219		5
Dec 9 - " 15	4.00	344	4800	338	215		11
" 16 - " 22	4.00	344	4800	375	215		11
" 23 - " 29	4.20	313	4800	3675	220		11
Jan 5, 1910	4.20	306	350	190	215		5
Jan 6 - " 12	3.00	239	500	239	210		5
" 13 - " 19	2.80	219	500	219	215		
" 20 - " 26	2.80	219	500	2375	230		5
Feb 2 - Feb 8	2.80	219	500	2375	244		
Feb 9 - " 16	3.40	219	500	300	255		
" 17 - " 23	3.00	219	3500	1750	251		4
" 24 - Mar 2	2.80	219	4100	2100	265		
Mar 3 - " 9	2.80	219	4200	2475	268		
" 10 - " 16	1.75	175	4200	2200	278		
" 17 - " 23	1.25	131	4200	2225	280		
" 24 - " 30	1.25	131	4200	2275	280		
Apr 1 - " 7	2.75	131	3600	1650	293		3

Farrowed Jan 11 2 boars, 2 sows 2011
Birth wt boars 2¹/₂"
" " sows 2¹/₂"

April 22, Pigs weaned
Change to bleegrass Sow Sick

June 22 Bred to Ornament

Sept 2, changed to Clover

Farrowed Oct 14, 4 boars, 4 sows
Birth wt of boars 2¹/₄"
" " sows 2¹/₀"
Oct 15 Washed 1 boar pig wt 3*

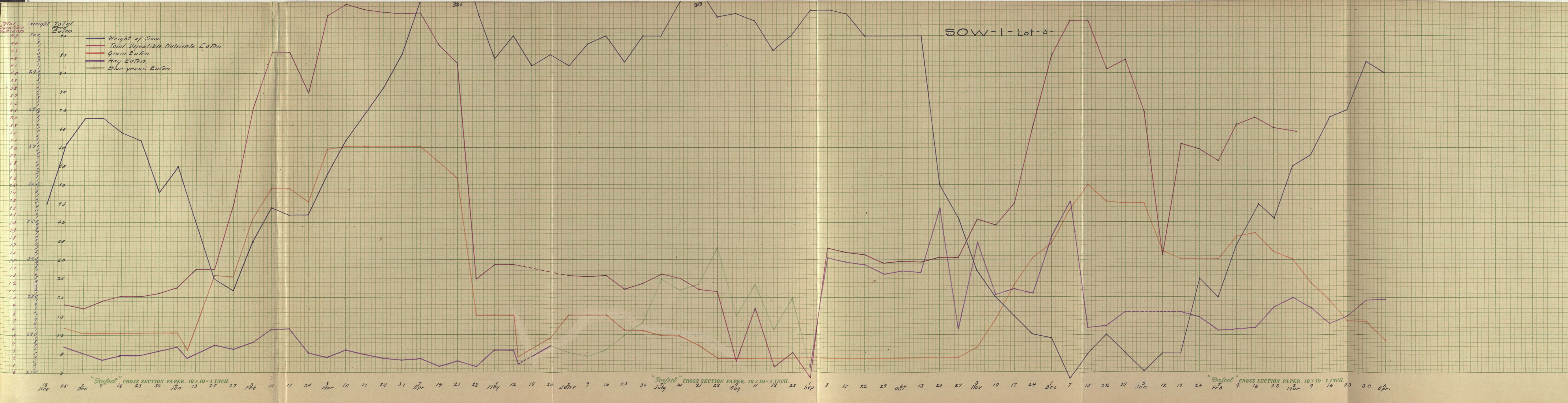
Pigs weaned Dec. 29th.

Bred Jan. 11,

Lot 3-

RECORD of SOW-1-

Date	1908	Protein	Nitrogen Free Extract	Ether Extract	Total Digestible Nutrients	Weight
Nov 18-	Nov 25	1.35	1.34	.47	9.16	2.55
" 26-	Dec 2	1.31	6.78	.43	8.52	2.71
Dec 3-	Dec 9	1.47	7.64	.47	9.58	2.78
" 10-	" 16	1.56	8.08	.49	10.13	2.74
" 17-	" 23	1.66	8.08	.49	10.13	2.72
" 24-	" 30	1.61	8.39	.50	10.50	2.58
Jan 7-	" 10	1.71	8.87	.53	11.30	2.65
" 31-Jan 6 of		3.59	3.67	.24	4.45	
Jan 11-	" 20	3.59	8.34	.13	23.06	5
" 21-	" 27	3.52	1.79	1.12	23.55	2.32
" 28-Feb	3	3.51	2.81	1.76	35.02	2.24
Feb. 4-	" 10	6.28	34.38	2.15	42.81	2.54
" 11-	" 17	6.28	34.38	2.15	42.81	2.52
" 18-	" 24	5.49	30.06	1.91	37.74	2.52
" 25-Mar	3	7.00	38.26	2.44	47.70	2.63
Mar 4-	" 10	7.24	39.50	2.51	48.69	2.79
" 4-	" 17	7.24	39.50	2.49	48.69	2.79
" 18-	" 24	7.05	38.69	2.47	48.25	2.86
" 25-	" 31	7.07	38.51	2.46	48.02	2.95
Apr 1-	" 7	6.35	35.22	2.24	45.81	3.10
" 8-	" 14	6.08	33.09	2.11	41.28	3.25
" 15-	" 21	6.08	33.09	2.11	41.28	3.25
" 22-	" 28	1.93	9.88	.63	12.44	3.05
" 29-May	5	2.22	11.40	.70	14.32	2.94
May 6-	" 12	2.22	11.40	.70	14.32	2.94
" 13-	" 14	.64	3.38	.20	4.22	3
" 15-	" 19	1.26	7.08	.43	8.77	2.92
" 20-	" 26	1.98	10.35	.64	12.97	2.92
" 27-June	2	1.96	10.28	.63	12.76	2.98
June 3-	" 9	1.97	10.28	.64	12.89	3.00
" 10-	" 16	1.60	8.90	.53	11.03	2.93
" 17-	" 23	1.70	9.60	.56	11.86	3.00
" 24-	" 30	1.90	10.70	.58	13.18	3.00
July 1-	July 7	1.80	10.70	.58	13.18	3.00
8-	July 14	1.80	10.70	.58	13.18	3.00
" 15-	" 21	1.66	8.98	.47	11.11	3.13
" 22-	" 28	1.52	8.90	.42	10.84	3.05
" 29-Aug	4	.96	5.30	.27	6.53	3.06
Aug 5-	Aug 11	1.22	6.96	.34	8.52	3.04
" 12-	" 18	.87	4.61	.24	5.72	2.96
" 19-	" 25	1.11	6.25	.31	7.67	3.00
" 26-Sep.	1	.65	3.20	.19	4.04	3.07
Sep 2-	" 8	2.59	13.25	.67	16.51	3.07
" 9-	" 15	2.53	12.61	.64	15.73	3.06
" 16-	" 22	2.30	11.73	.60	14.63	3.00
" 23-	" 29	2.35	11.99	.61	14.95	3.00
" 30-Oct	6	2.32	11.82	.60	14.74	3.00
Oct 7-	" 13	2.40	12.22	.62	15.24	2.60
" 14-	" 20	2.40	12.22	.62	15.24	2.60
" 21-	" 27	2.40	12.22	.62	15.24	2.51
" 28-Nov	3	3.06	16.35	.86	20.27	2.37
Nov 4-	" 18	3.01	15.65	.89	19.55	2.30
" 11-	" 17	4.13	22.22	1.29	27.64	2.25
" 18-	" 24	5.01	26.20	1.60	32.81	2.20
" 25-Dec	1	6.40	33.99	1.97	42.36	2.19
Dec 2-	" 8	6.90	37.95	2.33	47.18	2.08
" 9-	" 15	6.90	37.95	2.33	47.18	2.15
" 16-	" 22	6.07	32.40	2.02	40.49	2.20
" 23-	" 29	6.13	33.74	2.08	41.95	2.15
" 30-Jan	5	5.00	28.01	1.81	34.82	2.10
Jan 6-	" 12	3.64	10.74	1.29	15.67	2.15
" 13-	" 19	4.50	23.44	1.47	30.37	2.15
" 20-	" 26	4.41	23.95	1.45	29.81	2.30
" 27-Feb	3	4.18	22.70	1.39	28.27	2.30
Feb 3-	" 9	4.67	26.80	1.66	33.13	2.44
" 10-	" 16	4.79	27.64	1.70	34.13	2.55
" 17-	" 23	4.76	26.37	1.69	32.62	2.51
" 24-Mar	2	4.77	25.83	1.54	32.14	2.65



Lot-4-

RECORD OF SOW - 2 -

Corn Oilmeal
Clover hay ad libitum.

Date	1908	Corn	Oilmeal	Clover	Refuse	Weight	Gain	Loss
Nov 18 -	25	10.91	1.09	0	25.0			
" 26 - Dec 2	2	9.41	1.09	5.50	24.9	9	1	
Dec 3 - "	9	9.41	1.09	6.50	25.8			
" 10 - "	16	9.41	1.09	7.75	25.7	2	1	
" 17 - "	23	9.41	1.09	7.75	25.9			
" 24 - "	30	9.62	1.31	7.00	24.7	8	12	
" 31 - Jan 6 1909	30	8.81	2.19	0.50	22.2	8	25	
Jan 7 - "	13	18.81	2.09	1.0.50	23.0		15	
" 14 - "	20	19.13	2.25	1.4.00	21.2	9	13	
" 21 - "	27	23.50	2.63	2.4.00	20.1	9		
" 28 - Feb 3	3	29.75	3.56	3.5.00	21.2	1		
Feb 4 - "	10	56.00	4.38	5.0.00	21.2	6		
" 11 - "	17	56.00	4.38	5.0.00	21.2	6		
" 18 - "	24	66.00	7.00	1.7.50	21.8	8		
" 25 - Mar 3	3	66.00	7.00	1.7.50	22.6	4		
Mar 4 - "	10	63.00	7.00	1.7.50	23.0	7		
" 11 - "	17	63.00	7.00	1.7.50	23.7	8		
" 18 - "	24	63.00	7.00	1.7.50	24.5	7		
" 25 - "	31	63.00	6.75	1.7.50	24.5	8		
Apr 1 - "	7	65.00	6.11	1.7.50	25.1	6		
" 8 - "	14	45.00	2.88	1.2.50	26.6	6		
" 13 - "	19	36.00	2.63	2.0.00	26.6	5		
" 20 - "	26	17.50	2.19	1.2.50	27.2	3		
" 27 - June 2	9	17.50	2.19	7.00	27.5	3		
June 3 - "	16	17.50	2.19	7.00	27.7	2		
" 10 - "	23	17.50	2.19	7.00	27.3	2		
" 17 - "	30	14.00	1.75	1.4.50	27.5	2		
" 24 - "	7	14.00	1.75	3.0.00	27.3	2		
July 1 - "	14	14.00	1.75	3.0.00	27.5	1		
" 8 - "	21	14.00	1.31	3.7.50	28.0	1		
" 15 - "	28	7.00	.94	4.5.50	27.7	3		
" 22 - "	4	7.00	.88	4.5.50	27.4	3		
Aug 5 - "	11	5.25	.44	4.5.50	27.4	3		
" 12 - "	18	3.50	.44	2.6.00	26.2	3		
" 19 - "	25	3.50	.44	4.1.00	26.5	3		
" 26 - Sep 1	8	3.50	.44	4.0.00	26.0	5		
Sept 2 - "	15	3.50	.44	4.8.00	25.8	3		
" 22 - "	22	3.50	.44	4.9.00	25.5	3		
" 29 - "	29	3.50	.44	4.9.00	25.5	2		
Oct 6 - "	6	3.50	.44	4.9.00	25.2	3		
Oct 7 - "	13	3.50	.44	4.9.00	24.7	5		
" 14 - "	20	3.50	.44	4.9.00	24.3	4		
" 21 - "	27	3.00	.38	4.9.00	24.6	6		
" 28 - Nov 3	10	3.50	.44	4.9.00	24.0	3		
Nov 4 - "	17	6.50	.63	4.9.00	24.0	6		
" 11 - "	24	7.00	.66	4.9.00	23.5	5		
" 18 - "	31	7.00	.66	4.9.00	23.5	5		
Dec 2 - "	7	8.00	.75	5.6.00	24.4	7		
" 9 - "	15	8.00	.75	5.6.00	24.4	7		
" 16 - "	22	8.00	.88	4.9.00	25.0	5		
" 23 - "	29	8.00	.88	4.9.00	25.0	5		
" 30 - Jan 5 1910	6	10.50	.88	3.5.00	24.5	5		
Jan 6 - "	12	10.50	.88	3.5.00	24.5	5		
" 13 - "	19	10.50	.88	3.5.00	24.5	5		
" 20 - "	26	10.50	.88	3.5.00	24.5	5		
Feb 2 - "	3	10.50	.88	3.5.00	24.5	5		
" 9 - "	10	10.50	.88	3.5.00	24.7	5		
" 16 - "	17	10.50	.88	3.5.00	24.7	5		
" 23 - "	24	10.50	.88	3.5.00	25.0	5		
" 30 - Apr 6	6	10.50	.88	3.5.00	26.5	5		

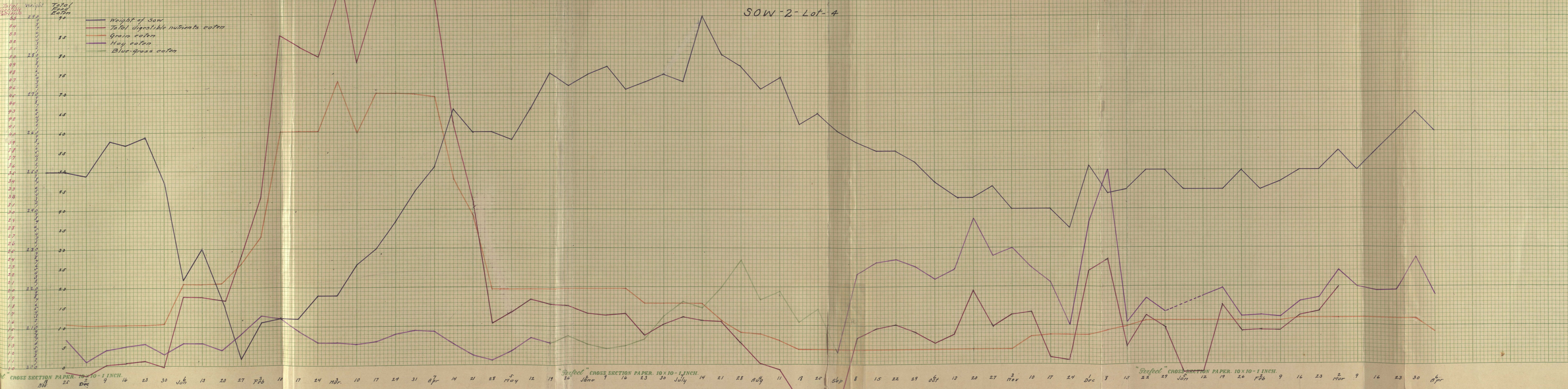
Farrowed Dec. 30 1908. 2 Boars & 2 Sows
Birth wt. of boars 2.4"
" " " Sows 2.13"

Weaned Apr 7

May 20 changed to bluegrass
Moved to hog barn
June 18. Bred to Ornament

Sept. 2 Changed to Clover

Date 1908	Protein	Nitrogen Free Extract	Ether Extract	Total Digestible Nutrients	Weight
Nov 18-					
" 18- Nov 25	1.18	764	.55	9.37	250
" 26- Dec 3	1.14	758	.51	8.73	250
" 3- Dec 9	1.34	8.11	.56	10.01	258
" 10- " 16	1.40	8.43	.58	10.44	257
" 17- " 23	1.43	8.61	.58	10.62	259
" 24- " 30 '09	1.34	7.90	.55	9.79	247
Jan 7- " 13	2.53	15.37	1.05	18.95	222
" 14- " 20	2.44	14.93	1.05	18.95	220
" 21- " 27	3.20	19.53	1.33	24.06	215
" 28- Feb 3	4.26	25.56	1.75	31.57	211
Feb 4- " 10	6.52	43.07	2.93	52.52	212
" 11- " 17	6.30	41.91	2.87	51.08	212
" 18- " 24	6.11	40.93	2.82	49.86	218
" 25- Mar 3	7.67	48.46	3.43	59.56	218
Mar 4- " 10	6.31	38.95	2.83	49.09	226
" 11- " 17	7.44	46.46	3.30	57.20	230
" 18- " 24	7.67	47.17	3.34	58.18	237
" 25- " 31	7.57	47.45	3.33	58.35	245
Apr 1- Apr 7	7.33	47.11	3.29	57.76	245
" 8- Apr 14	7.94	53.91	3.28	61.14	266
" 15- " 21	3.92	25.48	2.28	31.14	266
" 22- " 28	2.02	12.38	.90	15.33	260
" 29- May 5	2.26	13.63	.96	16.85	258
May 6- " 12	2.50	14.89	1.02	18.41	266
" 13- " 19	2.41	14.44	.99	17.84	275
" 20- " 26	2.24	13.86	.96	17.06	272
" 27- June 2	2.18	13.42	.94	16.54	275
June 3- " 9	2.15	13.21	.93	16.29	277
" 10- " 16	2.17	13.36	.94	16.47	271
" 17- " 23	1.80	11.17	.77	13.74	275
" 24- " 30	1.98	12.38	.82	15.18	275
July 1- July 7	2.10	13.13	.85	16.08	293
" 8- " 14	2.05	12.80	.84	15.69	290
" 15- " 21	1.77	11.06	.68	13.51	286
" 22- " 28	1.74	10.45	.61	12.80	277
" 29- Aug. 4	1.33	8.30	.50	10.13	277
Aug. 5- " 11	1.25	7.51	.44	9.20	274
" 12- " 18	1.74	11.64	.27	13.65	262
" 19- " 25	.84	5.31	.30	6.45	265
" 26- Sep. 1	.51	3.12	.21	3.84	260
SEP 2- " 8	1.99	10.79	.58	13.36	257
" 9- " 15	2.19	11.87	.63	14.69	257
" 16- " 22	2.25	12.13	.64	15.02	255
" 23- " 29	2.11	11.42	.61	14.14	252
Oct 7- " 13	1.89	10.26	.59	12.70	247
" 14- " 20	2.06	11.24	.50	13.92	244
" 21- " 27	2.25	12.89	.60	14.67	243
" 28-Nov. 3	2.55	15.89	.82	19.67	246
Nov 4- " 10	2.39	13.21	.69	14.99	240
" 11- " 17	1.51	8.50	.75	10.64	240
" 18- " 24	1.44	8.92	.54	10.97	230
" 25- Dec 1	3.23	21.97	.97	22.17	236
Dec 2- " 9	3.43	23.15	.97	23.61	251
" 10- " 15	1.66	10.10	.62	11.38	244
" 16- " 22	2.23	13.29	.80	16.32	250
" 23- " 29	2.01	12.12	.74	14.87	250
" 30-Jan. 5 '10	1.09	7.29	.51	8.89	245
Jan 6- " 12	1.09	7.29	.51	8.89	245
" 13- " 19	1.42	11.27	.84	12.53	245
" 20- " 26	1.92	11.68	.72	14.32	250
" 27-Feb. 2	1.92	11.68	.72	14.32	245
Feb. 3- " 9	1.19	11.68	.72	14.32	247
" 10- " 16	2.30	13.16	.81	16.27	250
" 17- " 23	2.37	13.52	.83	16.72	250
" 24-Mar. 2	2.94	16.02	.95	19.89	255



Lot-4-

RECORD OF SOW - 30 -

Date	1908	Corn	Oilmmeal	Claver	Refuse	Weight	Gain	Loss.
Nov. 18 -	Nov. 25	1	1.09	7.00	4.28	27.5	1.0	
" 26 -	Dec. 2	1	1.09	5.50	1.63	28.5	1.5	
Dec. 3 -	" 9	1	1.09	5.75	1.50	29.0	1.4	
" 10 -	" 16	1	1.09	6.50	2.20	29.5	3	
" 17 -	" 23	1	1.09	7.75	2.20	29.8		
" 24 -	" 25	1	1.09	8.00	2.00	27.9		
" 26 -	" 30	1	1.09	8.00	2.00	27.3		
Jan. 7 -	Jan. 13	1	1.09	8.00	2.00	27.3		
" 14 -	" 20	1	1.09	8.00	2.00	27.3		
" 21 -	" 27	1	1.09	8.00	2.00	27.3		
" 28 -	Feb. 3	1	1.09	8.00	2.00	27.3		
Feb. 4 -	" 10	1	1.09	8.00	2.00	27.3		
" 11 -	" 17	1	1.09	8.00	2.00	27.3		
" 18 -	" 24	1	1.09	8.00	2.00	27.3		
" 25 -	Mar. 3	1	1.09	8.00	2.00	27.3		
Mar. 4 -	" 10	1	1.09	8.00	2.00	27.3		
" 11 -	" 17	1	1.09	8.00	2.00	27.3		
" 18 -	" 24	1	1.09	8.00	2.00	27.3		
" 25 -	Apr. 3	1	1.09	8.00	2.00	27.3		
Apr. 4 -	" 10	1	1.09	8.00	2.00	27.3		
" 15 -	" 21	1	1.09	8.00	2.00	27.3		
" 22 -	" 28	1	1.09	8.00	2.00	27.3		
" 26 -	" 28	1	1.09	8.00	2.00	27.3		
" 29 -	May 3	1	1.09	8.00	2.00	27.3		

Corn
Claver hay ad Libitum

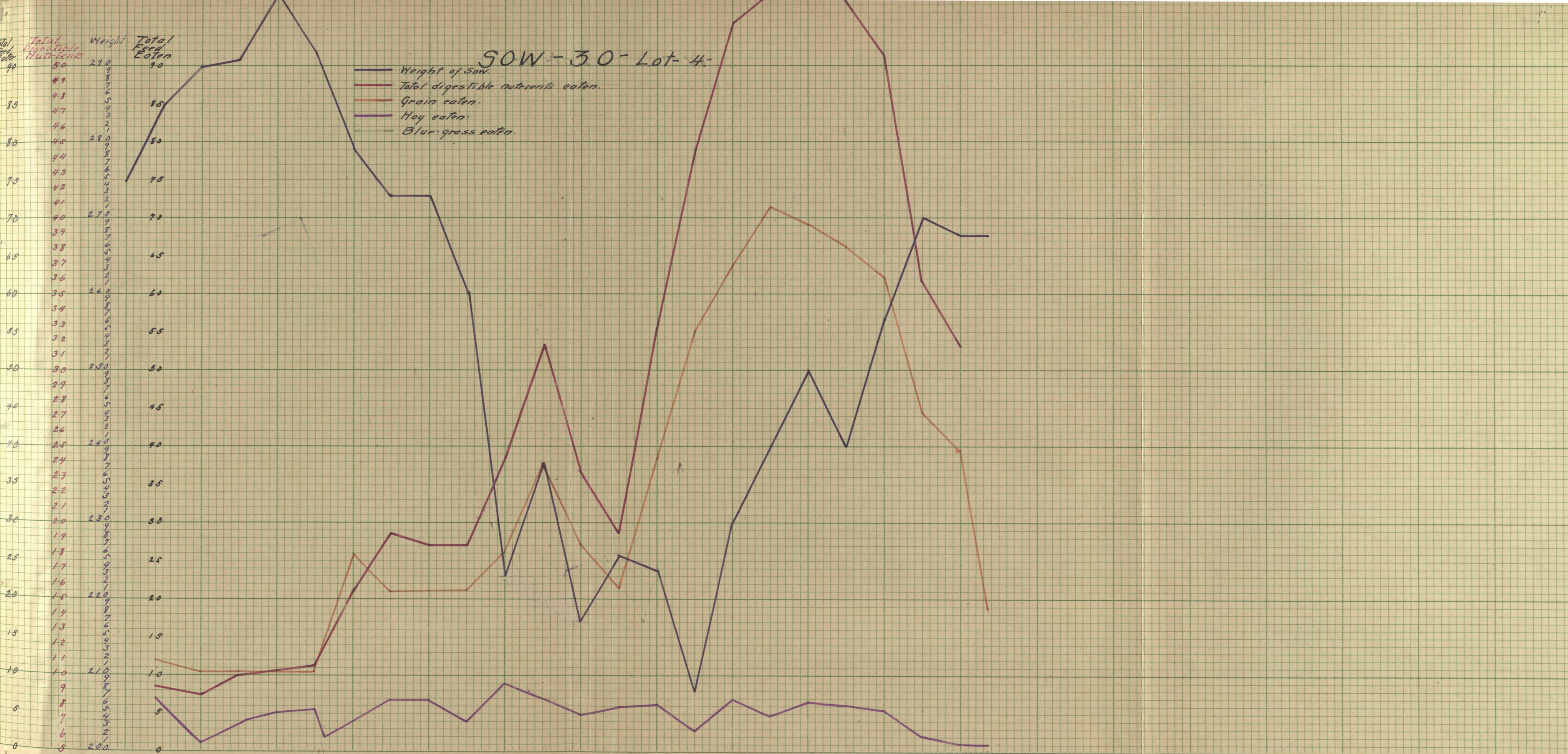
Oilmmeal

Dec. 22 Sow No. 30 Removed
Farrowed Dec. 26, 2 Sows by 2 bars
Birth wt of Sows 2.8"
" " " bars 2.9"

Pigs weaned Apr. 17.
Refused feed 2 days Apr 27+28,
" " Apr 29 & May 3.
May 3, Died of Cholera

Date. 1908	Protein	Nitrogen Feed Extract	Ether Extract	Total Digestible Nutrients	Weight.
Nov 18 - Nov 25	1.18	7.64	.55	9.37	27.5
" 26 - Dec 2	1.14	7.08	.51	8.73	28.5
Dec 3 - " 9	1.34	8.11	.56	10.01	29.0
" 10 - " 16	1.40	8.43	.58	10.41	29.5
" 17 - " 23	1.43	8.61	.58	10.62	29.2
" 24 - " 25	.33	1.95	.15	2.43	9
" 26 - " 30	1.79	10.90	.56	13.25	27.3
" 31 - Jan 6 09	2.59	15.69	1.08	19.36	27.3
Jan 7 - " 13	2.44	15.93	1.08	18.42	27.3
" 14 - " 20	2.44	14.93	1.05	18.42	26.0
" 21 - " 27	3.24	19.76	1.34	24.34	23.3
" 28 - Feb 3	4.15	26.85	1.80	31.80	23.8
Feb 4 - " 10	3.03	18.91	1.31	23.26	21.7
" 11 - " 17	2.52	15.72	1.08	19.32	22.6
" 18 - " 24	4.22	26.73	1.87	32.86	22.4
" 25 - Mar 3	5.75	36.84	2.68	44.17	20.8
Mar 4 - " 10	6.70	43.17	3.01	52.88	23.0
" 11 - " 17	7.34	47.15	3.33	57.82	24.0
" 18 - " 24	7.21	46.35	3.35	56.91	24.0
" 25 - " 31	6.96	44.26	3.12	54.34	24.0
Apr 1 - Apr 7	6.58	41.82	2.93	50.83	25.7
" 8 - " 14	4.23	29.59	2.02	36.84	27.0
" 15 - " 21	3.65	26.17	1.77	31.59	26.8
" 22 - " 25	1.81	12.44	.86	15.11	26.8

SOW-30-Lot-4-



— Weight of Sow.
 — Total digestible nutrients eaten.
 — Grain eaten.
 — Hay eaten.
 — Blue-grass eaten.

Total Digestible Nutrients
 50
49
48
47
46
45
44
43
42
41
40
39
38
37
36
35
34
33
32
31
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23
22
21
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16
15
14
13
12
11
10
9
8
7
6
5
 Weight
 90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0
 Total Feed Eaten
 90
85
80
75
70
65
60
55
50
45
40
35
30
25
20
15
10
5
0

18 Nov 25 2 Dec 9 16 23 30 Jan 6 13 20 27 Feb 10 17 24 May 10 17 24 31 Apr 7 14 21 28 May 12 19 26 June

"Perfect" CROSSSECTION PAPER. 10x10=1 INCH.



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BEFORE THEIR DUE DATES

University of Missouri - Columbia



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Neither is it to be checked out over-
night.

