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Some Factors Influencing Efficient Production of Sows

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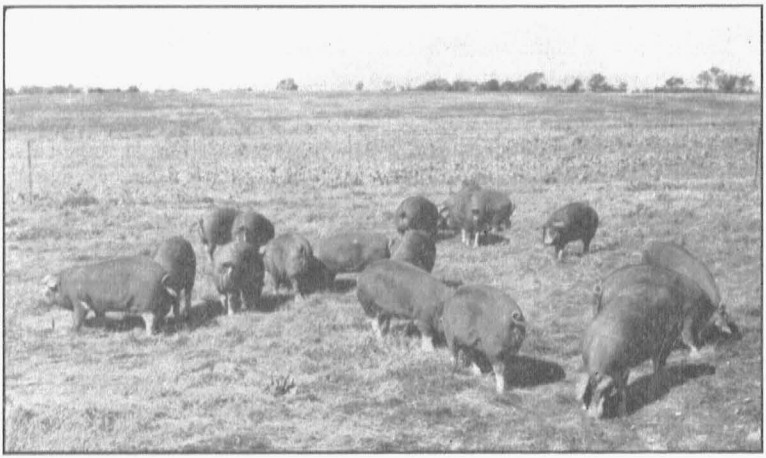

Gilts selected from high-producing dams inherit productive ability.

COLUMBIA, MISSOURI

SUMMARY

1. Efficiency of the brood sow is measured by prolificacy and suckling ability of the sow, and rate and economy of gains of the pigs.
2. A larger percentage of gilts bred twice (12-24 hours apart) during the same heat period conceived and farrowed larger litters than those bred only once.
3. Even though the percentage of pigs weaned per litter is greater for small litters, the important consideration is the larger number of pigs weaned when more pigs are farrowed (within limits, 9-13).
4. The average weight per pig at weaning was as great or greater in large litters than in small ones.
5. There was a direct relationship between birth weight and weight at weaning (56 days), and between birth weight and daily gain from birth to weaning.
6. Most pigs which weighed less than 2 pounds at birth either were born dead or died before weaning.
7. Pigs with heavy weaning weights had an added advantage in weight at 180 days of age, since they made more rapid gains in the feed lot after weaning.
8. In these experiments, when 10 pigs were raised per sow 341 pounds of feed (in addition to pasture) was required for each 100 lbs. of live hog marketed. When seven pigs were raised 448 lbs., and when only 4 pigs were raised 571 lbs. of feed was used for each 100 lbs. of live hog marketed.
9. Gilts from the higher producing dams made better sows than did gilts from poorer producers.
10. Sows with inverted nipples (blind teats) farrowed as large litters as sows with normal udders, and while there was a slight advantage in average weaning weight of pigs in favor of the sows with normal udders, the big difference was in number of pigs raised.
11. Pigs nursing sows with mastitis either died prior to weaning or had light weights when weaned.

Some Factors Influencing Efficient Production of Sows

L. A. Weaver and Ralph Bogart

For many years more efficient methods of pork production have been concerned primarily with better feeding, management and other environmental factors, and marked improvements have resulted. To a lesser extent consideration has also been given to selection of breeding animals and to breeding methods, and while progress has been made as a result of such studies, improvement has been somewhat limited because adequate production records have not always been available. The value and use which can be made of such records kept by practical breeders, as a basis for selection in improvement of swine, are considered in this publication.

ANIMALS USED

The data were collected during 1938-42 inclusive from University of Missouri swine breeding herds and animals used in the swine improvement project of the Regional Swine Breeding Laboratory. Most of the pigs were produced on clean ground and were self fed a well-balanced ration on pasture until they were weaned. Some, however, were fed on concrete floors from weaning to market weight.

RESULTS*

Improvements brought about by better breeding methods are concerned with prolificacy and suckling ability of the sow, and rate and economy of gains of the pigs.

1. Large Litters Essential

Fertility of Boar a Factor.—Evidence indicates that the quality of semen is reflected in the litter size as well as in the percentage of sows that settle. Data from natural and artificial breeding show a direct relationship between quality of semen and length of time the sperm are capable of fertilizing the eggs. Semen of poor quality has the capacity to impregnate the sow for only a very short time following breeding or insemination.

Gilts bred twice during the same heat (12-24 hours between services) showed a greater percentage of conceptions and farrowed

*Some of the data used were obtained in a swine improvement project conducted in cooperation with the Bureau of Animal Industry, U. S. Department of Agriculture.

more pigs per litter than gilts bred once during heat. Thirty-six of forty gilts (90%) bred twice during the same heat period conceived and farrowed 8.2 pigs per litter. Thirty-one of the 43 gilts (72%) bred once during heat produced 7.1 pigs per litter (Table 1).

TABLE 1.—INFLUENCE OF ONE AND TWO SERVICES UPON LITTER SIZE IN SWINE.

	Number Bred	Number Settled	Per cent Settled	Litter Size	Pig per Gilt Bred
Bred twice during heat	40	36	90	8.2	7.4
Bred once during heat	43	31	72	7.1	5.1

When stored (low quality) semen was used for artificial breeding, two inseminations (12 hours apart) during the same heat period gave more than twice the percentage of conception obtained with one insemination during heat (Table 2).

TABLE 2.—INFLUENCE OF ONE AND TWO INSEMINATIONS UPON PERCENTAGE OF SOWS THAT SETTLED.*

	Number Sows Inseminated	Number Settled	Per cent Settled
Inseminated twice during heat	34	18	53
Inseminated once during heat	30	7	23

*Lasley, John F., 1940, Artificial insemination of swine and storage of boar semen. University of Missouri Master Thesis—1940.

Observations indicate that breeding or inseminating more than once during heat is more important when boars of lower fertility or stored semen are used.

While the data indicate that under certain conditions there may be an advantage in allowing two services at intervals during the same heat period, it should not be assumed that this would always be true; and, certainly if such a practice would result in over working the boar then one rather than two services might be indicated. If only one service is given better results may be expected if it occurs near the end rather than at the beginning of estrus.

Within Limits—Large Litters Result in More Pigs Raised to Weaning.—Although the birth weight of pigs in large litters may not be as great as those in litters of smaller size, strong pigs of moderate to heavy weights may be produced in large litters (Table 3). Pigs in litters of 10 averaged almost three pounds each while pigs in smaller litters exceeded this weight by only 0.1 to 0.3 pounds per pig. The percentage of pigs raised was greatest in

small litters, but in general the number of pigs weaned was greater for litters of ten or more. These data indicate that within limits large litters are superior to small litters because of the greater number of pigs weaned in the larger litters (Table 3).

TABLE 3.—INFLUENCE OF LITTER SIZE UPON BIRTH WEIGHT AND MORTALITY OF PIGS.*

Number in Litter	Number of Litters	Average Litter Weight	Average Birth Weight Per pig	Per cent Farrowed Dead	Per Cent Weaned	Average Number of Pigs Weaned
4	19	12.3	3.1	0.0	98.5	3.9
5	7	15.1	3.0	0.0	94.3	4.7
6	7	19.3	3.2	0.0	78.6	4.7
7	9	21.8	3.1	2.0	81.2	5.7
8	8	22.5	2.8	0.0	64.1	5.1
9	22	26.0	2.9	2.4	71.0	6.4
10	26	29.1	2.9	8.5	70.6	7.1
11	11	29.3	2.7	11.0	62.4	6.9
12	5	30.6	2.6	22.0	45.0	5.4
13	5	34.1	2.6	20.0	72.7	9.5

*Tables 3-9 inclusive from Stampe, W. W. 1940. The influence of initial weights of swine in early life upon subsequent growth rate. University of Missouri Masters Thesis.

Large Litter Size at Weaning Increases Total Weight but May Not Reduce Average Weaning Weight Per Pig.—The data presented in Table 4 demonstrate that an increase in the number of pigs weaned per litter increases the total litter weight, but does not necessarily lessen the average weight per pig at weaning. It is likely that litters of more than ten pigs may result in a reduced milk supply per pig and, thus, a smaller weaning weight per pig. When very few pigs are weaned per litter they are usually light in weight. Perhaps the stimulation by nursing of only one or two pigs is not sufficient to cause a heavy milk flow. In addition, factors which cause the sow to farrow few pigs may also prevent her from producing large quantities of milk.

TABLE 4.—RELATION OF NUMBER OF PIGS WEANED PER LITTER TO WEANING WEIGHT.

Number of Pigs Weaned	No. Litters in Group	Average Litter Weaning Weight	Average Weaning Weight per pig
1	2	14.0	14.0
2	6	58.7	29.3
3	4	107.8	35.9
4	27	124.6	31.2
5	18	144.1	28.8
6	13	209.4	34.9
7	19	230.1	32.9
8	13	269.9	33.7
9	13	263.2	29.3
10	2	324.5	32.5

Experience shows that if the number of pigs farrowed exceeds the number of functional teats, the size of litter will soon

be reduced to the number of teats functioning. After the litter size is thus adjusted, the milk flow per pig is about the same regardless of number of pigs except, as mentioned, with very small litters there may actually be a decrease in milk available per pig.

2. Large Pigs at Birth Indicate Vigor and Ability to Make Rapid Growth

Heavy Birth Weights Result in Heavy Weaning Weights.—Pigs that are large and vigorous at birth grow more rapidly and weigh more at weaning time than pigs with light birth weights, (Table 5).

TABLE 5.—INFLUENCE OF BIRTH WEIGHT OF PIGS UPON GAIN IN WEIGHT AND WEANING WEIGHT.

Birth Weight Groups	Number of Pigs	Mean Birth Weight	Weaning Weight 56 Days	Gain in Weight 56 Days	Daily Gain
Below 2.5 lbs.	81	2.2	25.7	23.6	.42
2.5 - 3.0	159	2.7	28.9	26.2	.45
3.0 - 3.5	206	3.2	32.9	29.7	.53
3.5 up	150	3.8	37.0	33.2	.59

One pound advantage in size of pig at birth resulted in about a seven-pound advantage at weaning. The gain per day was therefore directly associated with size of pig at birth.

Pigs Small at Birth Usually Die.—A large percentage of the pigs weighing less than 2.0 lbs. at birth either are born dead or die during the suckling period. Some successful operators make a practice of destroying the very small pigs at birth, particularly if there is a satisfactory number of larger pigs in the litter. Small, weak pigs not only have little chance for survival, but in addition they may be a further liability by causing restlessness, etc., of the sow, thus increasing the chances of her overlaying other pigs in the litter.

TABLE 6.—INFLUENCE OF SIZE OF PIG AT BIRTH UPON MORTALITY.

Birth Weight Groups	Number of Pigs	Percent Farrowed Dead	Percent Total Mortality	Percent Weaned Based on all Pigs Born
Under 1.5 lbs.	36	47.2	94.5	5.5
1.5 - 2.0 lbs.	65	23.0	78.5	21.5
2.0 - 2.5 lbs.	177	13.5	53.0	47.0
2.5 - 3.0 lbs.	240	4.2	31.3	68.7
3.0 - 3.5 lbs.	283	2.1	17.7	82.3
3.5 - 4.0 lbs.	144	0.0	13.2	86.8
4.0 - up lbs.	43	0.0	16.3	83.7

It would appear from Table 6 that pigs large at birth have a greater chance for survival than smaller ones. In this study no

large pigs were farrowed dead while many of the small pigs were dead at birth. Although pigs small at birth have little chance for survival, very large pigs have as great mortality as pigs weighing 3 lbs. at birth. The advantage of pigs heavier than 3 lbs. at birth is concerned with growth rather than survival.

3. Importance of Large Size of Pigs at Weaning

Weaning Weight in Relation to Gain Per Day and Weight at Six Months of Age.—Rate of growth from weaning until the pig is marketed is important because the pigs that grow fastest usually do so most economically. Also, the more growthy pigs require a shorter time to produce market hogs and thus reduce labor, risk and similar expenses. The size of the pig at weaning is a reflection of both the capacity of the pig to grow and the ability of the sow to produce a liberal supply of milk. Pigs do not normally eat much grain feed until they weigh 20 lbs. or more, regardless of the age at which this weight is reached. With extremely growthy pigs this weight may be attained at three weeks of age, while slow gaining pigs may weigh no more than this when weaned (8 weeks). Thus, the pig that is very small at weaning age may have difficulty in adjusting itself from nursing to eating grain, whereas the large pig at weaning is accustomed to eating and experiences little or no set-back from weaning.

There is a direct relationship between gain per day after weaning and weight at 6 months of age with size of pigs at weaning time.

TABLE 7.—INFLUENCE OF WEIGHT OF PIG AT WEANING UPON FUTURE FEED LOT PERFORMANCE.

Weaning Weight Groups	Number of Pigs	Mean Weaning Weight	Gain per Day	Weight at 6 Months of Age
15-20 lbs.	14	16.9	1.4	189.0
20-25 lbs.	40	22.2	1.4	196.0
25-30 lbs.	90	27.2	1.4	202.8
30-35 lbs.	78	32.1	1.4	208.8
35-40 lbs.	58	36.7	1.5	218.5
40-45 lbs.	26	41.7	1.5	228.2
45-50 lbs.	22	46.8	1.5	233.9
50-55 lbs.	7	52.9	1.6	254.0

Pigs which have a light weight when weaned are at a disadvantage because while they have practically the same cost of production as larger pigs at weaning they must obviously gain more after weaning to reach the same market weight. These small pigs also make less daily gain. Thus pigs weighing about 17 lbs. each at weaning gained about 1.4 lbs. per pig per day, while 50 lb. pigs

at weaning (8 weeks) gained 1.6 lbs. per pig per day (Table 7). Because of the greater weight at weaning and the larger daily gains, the heaviest pigs at weaning reached 254 lbs. at 6 months of age, while the smallest pigs at weaning weighed only 189 lbs. at 6 months of age.

Weaning Weight Influences Length of Feeding Period.—Large pigs at weaning require less time to reach a market weight of 225 lbs. than smaller ones because they have less gain yet to make, and their daily gains are greater.

TABLE 8.—INFLUENCE OF SIZE OF PIGS AT WEANING UPON TIME REQUIRED TO PRODUCE MARKET HOGS OF 225 LBS. WEIGHT.

Weaning Weight Groups	Number of Pigs	Age when Weight=225 lbs.
15-20 lbs.	3	214 days
20-25 lbs.	6	209 days
25-30 lbs.	18	200 days
30-35 lbs.	32	192 days
35-40 lbs.	35	181 days
40-45 lbs.	20	176 days
45-50 lbs.	20	171 days
50-55 lbs.	7	160 days

Growthy pigs should reach a market weight of 225 lbs. at 6 months of age. To reach this weight in the time allotted, pigs in this experiment had to weigh at least 35 lbs. when weaned. Pigs weighing 40 lbs. or more reached a market weight of 225 lbs. in less than 6 months of age. The smallest pigs in this study required 54 days longer to reach the same market weight than the largest pigs at weaning.

Litter Mates that Differ in Weaning Weights also Differ in Gains made in Feed Lot.—The largest and the smallest pigs were selected from each of 15 litters. The larger pigs were fed in one lot and the smaller pigs in another. The daily gains, weight at 6 months of age, and time required to reach 225 pounds were all in favor of the larger pigs.

TABLE 9.—INFLUENCE OF SIZE OF LITTER MATE PIGS AT WEANING UPON PERFORMANCE IN THE FEED LOT.

	Large Pigs	Small Pigs
Number of Pigs	15	15
Weaning Weight	34.9 lbs.	18.4 lbs.
Weight at 6 months	197. lbs.	130. lbs.
Gain per day	1.28 lbs.	.99 lbs.
Time required to reach 225 lbs.	198 days	286 days

The group of inferior pigs had the same parents and were handled under the same conditions, yet the larger pigs were

superior in feed lot performance. Three months or more time was required to produce market hogs from the inferior pigs of the litter than from the best pigs in the litter.

The pair of litter mates showing the largest differences are shown in Fig. 1.

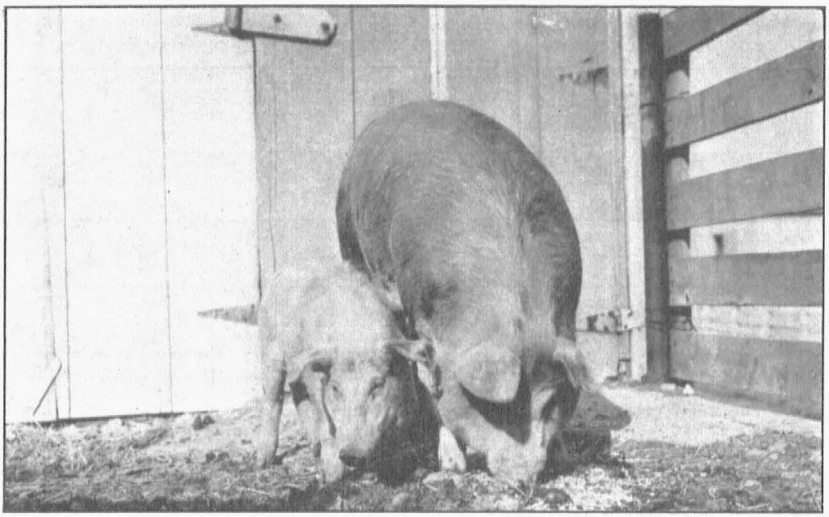

Fig. 1.—Litter mates (see Table 9).

4. Economic Importance of Productivity of Sows

The total litter weight at weaning and number of pigs weaned are two important ways of measuring productivity, or the ability of a sow to farrow and suckle a litter.

The following grades have been arbitrarily selected to indicate relative productivity of sows used in this study:

Excellent—sows which produce at least 8 pigs that weigh not less than 400 lbs. per litter at weaning (56 days).

Superior —sows which produce at least 7 pigs that weigh not less than 325 lbs. when weaned.

Good —sows which produce at least 6 pigs that weigh not less than 250 lbs at weaning.

Medium —sows which produce at least 5 pigs that weigh not less than 175 lbs. at weaning.

Inferior —sows which produce less than 5 pigs per litter or litter which weighs less than 175 lbs. when weaned.

This classification then emphasizes the importance of fertility of the sow, her ability to suckle, and the growthiness of the pigs in early life.

Economic Comparison of Sows Differing in Level of Productivity.—In order to demonstrate the economic importance of sow productivity, the records of three typical (2 year old) sows, one each of the inferior, medium, and good producers are presented in Table 10.

TABLE 10.—THE AMOUNT OF PORK MARKETED AND THE FEED COST OF PRODUCTION FOR SOWS OF INFERIOR, MEDIUM AND GOOD PRODUCTIVITY.

Kind of Sow	No. Pigs	Weight at Weaning (lbs.)	Weight 6 Months of Age (lbs.)	Feed Consumed Up to Weaning* (lbs.)	Feed Consumed Fattening Period** (lbs.)	Total	Feed per 100 lb. of hog marketed (lbs.)
Good Producer	10	Litter 320	2595	1950	6911	8861	341
		Per pig 32	259	195	691	886	
Medium Producer	7	Litter 186	1314	1830	4061	5891	448
		Per pig 27	188	261	580	841	
Inferior Producer	4	Litter 116	666	1710	2090	3800	571
		Per pig 29	167	428	523	951	

*Feed of sow from breeding and sow and litter to time pigs weaned. All animals fed on clean pasture. No allowance has been made for pasture, or for gain or loss in weight of sows.

**Pigs self fed on legume pasture.

These sows were fed a good ration on pasture during pregnancy and while the pigs were nursing. The pigs on legume pasture grown in a field on which no hogs had run for 2 years, were self fed a balanced ration composed of corn. tankage and soybean oil meal. No allowance for pasture consumed has been made in the calculations. The feed (in addition to pasture) required to produce each 100 pounds of market hog from the time the sow was bred until the pigs were six months of age was 341 lbs. for the good producing sow, 448 lbs. for the medium producer, and 571 lbs. for the inferior sow (Table 10). In addition to a lower feed cost per 100 lbs. of live hog marketed, there were more pigs from the good producing sow and these pigs grew more rapidly. It is, therefore, evident that the overhead and labor charges would be less per given amount of pork marketed from the better producing sows.

Another way of showing the economic importance of sow productivity is to calculate the necessary selling price of fat hogs, produced by inferior, medium and good sows, to cover feed costs. Such figures illustrate how good producing sows contribute to the profitability of the pork production enterprise. With feed costs of $1.00 per cwt. the pigs from the good sows must bring $3.41 per cwt. to cover feed costs, while pigs from poor sows must bring $5.71. When feed prices are high, the differences are even more

marked. Feed prices of $3.00 per cwt. would require a selling price of $10.23 per cwt. of live hog marketed for the good sows, $13.44 for the medium, and $17.13 for the inferior.

TABLE 11.—NECESSARY SELLING PRICE TO COVER FEED COSTS OF FAT HOGS (225 LBS.) PRODUCED BY SOWS OF GOOD, MEDIUM AND INFERIOR PRODUCTIVITY.

Kind of Sow	Weight of fat hogs marketed per sow (lbs.)	Feed Consumed*		Necessary selling price per cwt. fat hog to cover costs from time sow is bred when feed sells for				
		Per litter (lbs.)	Per 100 lbs. hog marketed (lbs.)	$1.00	$1.50	$2.00	$2.50	$3.00
Good	2595	8861	341	$3.41	$5.12	$6.82	$8.53	$10.23
Medium	1314	5891	448	4.48	6.72	8.96	11.20	13.44
Inerior	666	3800	571	5.71	8.57	11.42	14.28	17.13

*Pigs self fed on good legume pasture. No allowance for pasture has been made.

Productivity of sow at One Farrowing Indicative of Results which may be Expected Later.—When sows and gilts are maintained under good conditions of feeding, sanitation and management, productivity is largely a reflection of ability to produce. The productivity of a sow, however, may not be the same for each farrowing but one production record is an indication of what may be expected with succeeding litters, although it is recognized that the larger the number of records available for an individual sow the more accurately future performances may be predicted.* It is important then that poor producing sows should be eliminated early because they will usually continue to be poor producers. Failures which result directly from poor care and management should not too seriously discredit the productivity of the sow in question. Also gilt litters usually contain a smaller number of pigs of lighter weight than litters from sows.

5. Productivity of Sow is Important in Selecting Gilts

To demonstrate the relation of productivity of the dam with that of her daughter, all sows were classified according to the scheme presented above, and then dam-daughter comparisons were made. Results presented in Table 12 show quite a close agreement in the productivity of the daughters with that of their dams. Inferior producing sows never produced daughters which rated better than medium and most of their daughters were inferior (86.4%).

Medium producing sows produced a large number of medium producing daughters (52.2%), with a greater proportion of offspring not falling in the medium class, being inferior rather than good (Table 12).

*Lush, J. L. and Molln, A. E. 1942. Litter size and weight as permanent characteristics of sows. U.S.D.A. Tech. Bul. 836.

The good sows produced more than twice (2.3) as many good producing daughters as did the medium producing sows. Also, fewer medium and inferior producing sows were produced by the good sows. Only one superior animal was present in this study, and she was produced by a good sow (Table 12).

TABLE 12.—PRODUCTIVITY OF DAUGHTERS FROM GOOD, MEDIUM, AND INFERIOR PRODUCING DAMS.

Type of Dam	Number Sows in Study	Total No. daughters in each class		Number and percentage daughters in each class			
				Superior	Good	Medium	Inferior
Good	26	69	Number	1	28	20	20
			Percent	1.5	40.6	29.0	29.0
Medium	22	46	Number	0.0	8	24	14
			Percent	0.0	17.4	52.2	30.4
Inferior	17	22	Number	0.0	0.0	3	19
			Percent	0.0	0.0	13.6	86.4

It is evident from Table 12 that the productivity of the dam is important in selecting gilts. The evidence indicates that selection is necessary to even maintain the level of productivity in the sow herd. One should not lose sight of the fact that the boar also transmits factors which are concerned in the productivity of his gilts and that he should therefore be selected from the better producing sows.

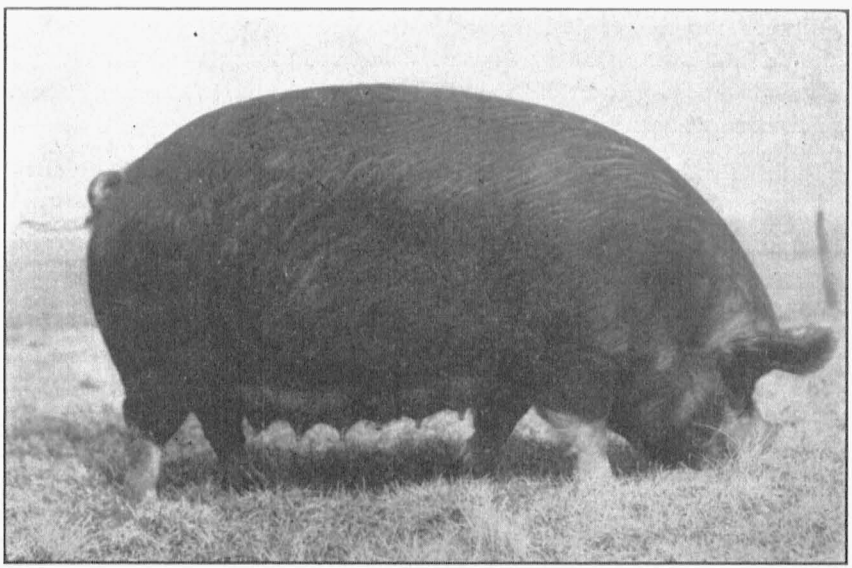

Fig. 2.—Showing one side of a desirable udder.

6. A Normal Udder is Important in Suckling Ability of the Sow

The number of teats and how they are spaced are important. Few teats or those improperly spaced result in a reduced milk supply.

In Figure 2 a desirable udder is shown with which other illustrations may be compared. One should note that this sow has seven well-spaced teats on the side and that, with the possible exception of the rear teat, they are reasonably well developed.

Inverted (Blind) Nipples Do Not Function.—Sometimes the nipple is not normally developed but turns back into the surrounding tissues rather than protruding outward (Figure 3). Such nipples cannot be nursed by pigs and might not function even if it were possible for the pigs to nurse them. The little pigs soon learn which teats are giving milk and can be nursed, as shown in Figure 3.

Fig. 3.—Three inverted nipples on the right side. Note that the pigs nurse only the good teats.

In all the cases of inverted nipples observed, none have been functional. When the number of live pigs farrowed exceeded the number of teats, the litter size in each case was reduced to the number of teats other than those which were inverted.

Economic Importance of Inverted Nipples.—Inverted nipples decrease the number of functional teats, and hence the amount of

total milk production; but, they may not cause a lowered milk flow from the individual normal teat.

In Table 13 the production records of three sows having inverted nipples are compared with records of two sows with normal udders. The size of the litter at weaning time was reduced as a result of the inverted nipples, but the weaning weights of the individual pigs raised demonstrate that those teats which did function produced in a normal manner (Table 13).

TABLE 13.—COMPARISON OF PRODUCTION RECORDS OF SOWS WITH INVERTED NIPPLES AND THOSE WITH NORMAL UDDERS.

Sow Number	Number of Blind Teats	Number of Live Pigs Born	% Live Pigs Raised	% Pigs Starved as Result of Blind Teats	Weaning Weight Per Pig
8	6	11	45	55	32
55	3	11	45	27	39
39	3	15	40	20	35
9	0	10	90	0	37
13	0	7	100	0	44

The udder of a sow which had four inverted nipples on the left side and three on the right is shown (Figure 4) as the most extreme example of inverted nipples which has been observed in these studies. This sow farrowed 14 strong pigs, but raised only four because she had only four functional teats. Only three well-developed teats can be seen (Figure 4), since the fourth was a rear teat and its appearance is blocked by a rear leg.

Fig. 4.—Three inverted nipples on right side and four on left side. This sow farrowed 14 strong pigs but raised only 4. Picture taken two days after farrowing.

Inverted Nipples are Inherited (Not a breed characteristic).—Relatively few hogs have inverted nipples, but the abnormality may occur in all breeds of swine. Even when sows with this abnormality are used in a cross breeding program with other breeds having no inverted nipples, some of the back cross or three-way

cross gilts may have inverted nipples. Observations demonstrate that inverted nipples have a hereditary basis,* but because of meager evidence the mode of inheritance has not been definitely deduced. Sufficient data are available, however, to show that this abnormality is inherited in a complex manner, and to demonstrate that the boar can pass the undesirable inheritance on to his offspring.

Breeding stock should be carefully selected and only gilts with well-developed teats and out of sows having desirable udders should be retained for the breeding herd.

Inverted Nipples can be Detected in Early Life.—Inverted nipples can usually be detected at birth, and are positively discernable when gilts are old enough to breed. The error in predicting at birth whether nipples were inverted or normal was less than 5% with 40 gilts maintained until they had suckled one crop of pigs. A few teats recorded at birth as inverted were later found to be functional, but none called normal at birth were inverted when the animal came into lactation.

Mastitis (Caked Udder) Is a Serious Abnormality.—Sometimes one or more of the mammary glands becomes greatly enlarged, is painful to the sow, and usually is accompanied by fever (Figure 5). The sow may continue to give some milk from the

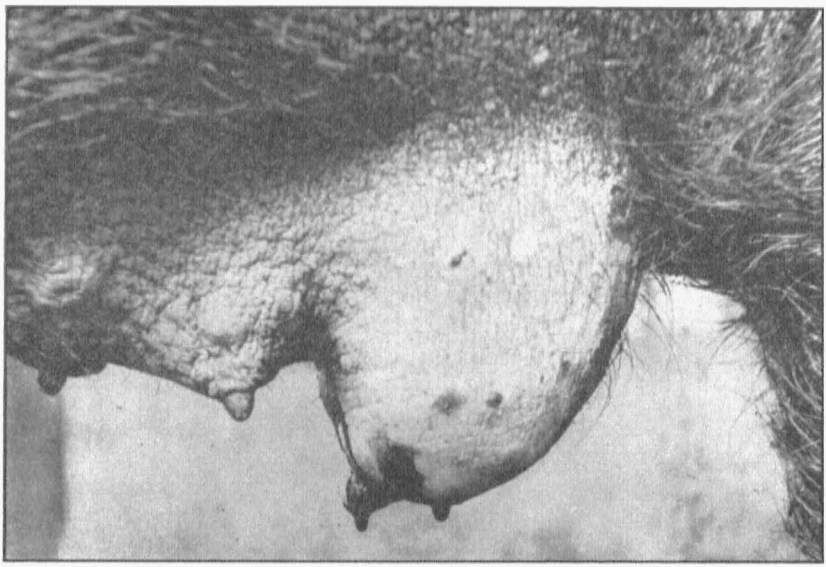

Fig. 5.—Severe mastitis in one mammary gland of the sow. Also one inverted nipple is shown.

*Nordby, J. E. 1934. Congenital defects in the mammae of swine. Journ. Hered. 25:499-502.

other teats if her general condition is not too adversely influenced by mastitis. However, pigs nursing the other teats usually become unthrifty which indicates that affected sows fail to suckle in a normal manner.

In all the cases where sows with mastitis have been observed, the pigs nursing such sows were either lost, or those that survived were small at weaning time.

When the enlarged udders are removed surgically the sows usually recover, and remaining teats produce milk normally during future lactations. If not removed, those udders that are affected may regress some in size during the dry period, but normally never recover and show an increased enlargement in succeeding lactations. Sometimes the gland is so abnormal that it opens and drains for indefinite periods (Figure 5). In all cases of severe mastitis the sow becomes less thrifty and may even lose considerable weight.

This condition, like inverted nipples, seems to occur in certain lines of breeding and not in others. The data indicate that such lines apparently inherit a weakness which permits mastitis to develop, since in a large group of sows of varied breeding pastured and fed together in this study affected animals were limited to one family. Our data indicate that susceptibility to mastitis is inherited in a complicated manner. Since this is true, it may be desirable to consider discarding from the breeding herd not only those sows having mastitis, but their offspring and also any sow or boar whose daughter or sister develops the disease.

Mastitis has never been observed in a gland associated with an inverted nipple, but only in udders which have once been apparently normal. There is no relation, then, between inverted nipples and mastitis, although the same sow may have both (Figure 5).

CONCLUSIONS

1. Within limits, an increase in size of litter does not result in a decrease in average weight per pig at weaning.
2. There is a direct relationship between (a) weight of pig at weaning (b) feedlot performance after weaning and consequently (c) weight at 180 days of age.
3. With larger litters there is less feed (and overhead costs) required to produce 100 lbs. of marketable pork.
4. Gilts selected from efficient producing sows inherit productive ability.