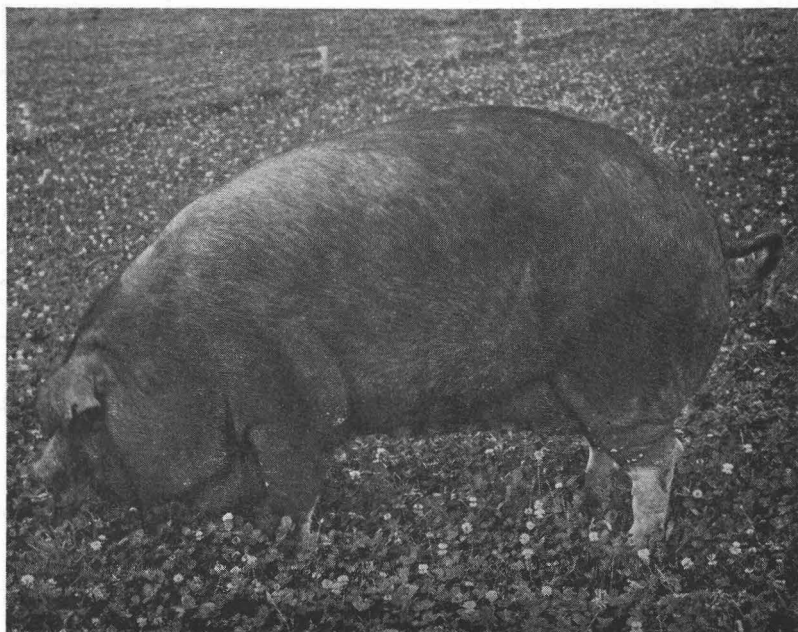


# *Swine Management*

## **IN OREGON**

*By H. A. Lingren and A. W. Oliver*



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*Cover illustration—*

Deep-bodied sows should constitute the breeding herd.

# Swine Management

By

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The production of hogs in Oregon at the present time is very much less than the pork requirements of the state. Oregon farmers have been producing about half the pork consumed within the state. The production of hogs has been limited because feed grain has not been available to take care of the needs of all classes of livestock. This situation has changed in view of the fact that wheat is as low in price as other feed grains and that Oregon produces a surplus of this grain.

Many farmers in the dairy business can well afford to consider hogs as a means of marketing skim milk or buttermilk. Other farm wastes in Oregon, such as cull fruits and vegetables, can be utilized profitably as hog feed. The gleaning of waste on grain stubble is also suggested.

The hog offers a means of marketing grain to very good advantage. Each pound of the fat hog represents from 4 to 4½ pounds of grain or its equivalent and can be transported to market more cheaply than grain.

Alfalfa, clover, and rape are all valuable pasture crops for hogs and can be used to advantage in lowering the cost of production by reducing the amount of grain required in putting on 100 pounds of increase in weight.

The market outlet for hogs produced in Oregon, providing more are grown than will be consumed in the state, will be in the Pacific trade areas, especially California.

## CAREFULLY SELECT THE BREEDING STOCK

The foundation of profitable hog raising is a careful selection of the breeding stock. While there are some differences between breeds, there is a greater variation in type within the breeds. So in the selection of the breeding animals for the foundation herd, it is more important to choose the desired market type than it is to select a breed.

At present consumers demand a lighter cut of meat with less fat. Lard comes in competition with other cooking fats or oils, and, consequently, hog growers everywhere are giving attention to a type of pig that will produce less lard. Ordinarily a 200- to 210-pound meat-type hog satisfies the Coast markets much better than the thick,

"chuffy" type that was formerly produced. Hogs must carry enough fat, however, to produce firm meat.

### SELECTING SOWS

Big, thrifty, vigorous sows with deep, long bodies and well-proportioned depth and width are desirable. Large, long-bodied sows usually produce more pigs than the short, thick kind. The back of the sow should be strong with a well-developed arch. In view of the fact that the hog is a machine to turn feed into pork, it is important that attention be given to a strong constitution as this is indicative of good feeding ability. Strong feet and pasterns should not be overlooked, as animals with strong bones and feet are less apt to become crippled, which causes a serious annual loss in the hog business.

The sow should have a well-developed udder with 10 to 12 sound teats so that a large litter can be raised. Inverted or blind teats that never function are quite common. In selecting the sow, care should be given to avoid animals that carry this defect. The sow should be feminine as indicated by a neat head and neck. Such a sow is usually more apt to be a good mother. A coarse, staggy head indicates a poor mother. Quality should be given consideration. This is shown in smoothness over the body. Fine hair and skin free from wrinkles, neat ears, and clean bone indicate high quality in hogs. To obtain good quality in market hogs, avoid breeding stock that is coarse, wrinkled, soft, and flabby.

Again remember that a large, vigorous sow usually will transmit size and vigor to her pigs. Pigs that gain rapidly are the most profitable; hence a thrifty, active sow, large for her age, is a good choice.

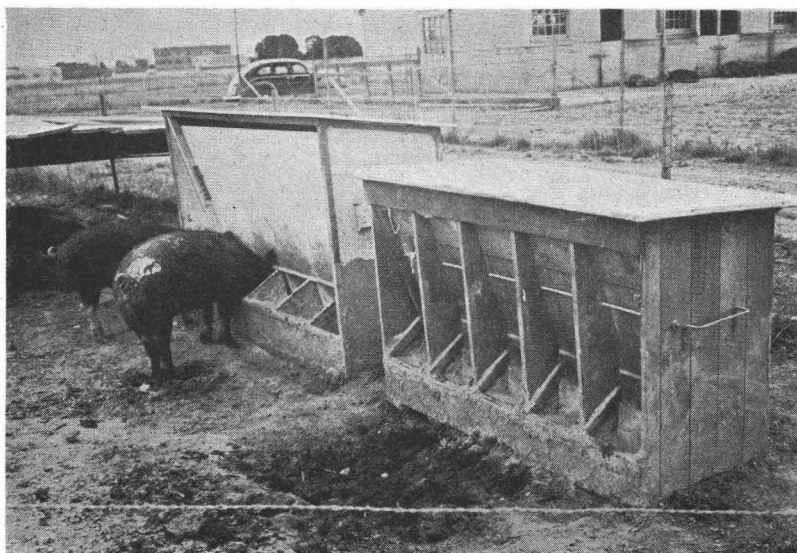
**Selecting sows for high production.** Hog raisers throughout the country are giving more and more attention to the past performance of a sow. This fact makes it highly desirable to select breeding stock from animals raising the best litters. The weight of a litter of pigs is a reasonably accurate measure of the profitableness of the breeding stock. Weights of the pigs at weaning time can be easily obtained. Such information is useful in culling the sow herd before the next year's breeding season. The weight of the litter at 180 days of age, which is usually about the marketing age, is an excellent indication of the sow's ability to produce pigs that feed out well. At the University of Minnesota, the weights of 40 litters of pigs showed big differences between litters when 56 days of age. No litter of less than six pigs was weighed and the largest litter weaned consisted of 12 pigs. The average weight of the 40 litters was 223 pounds; the lightest, 129 pounds; the heaviest, 344 pounds. In general, litters

with large numbers of pigs were heavier than the small litters, but the largest litter did not have the heaviest weight.

**Weight an important factor.** Sow pigs to be used for the next year's breeding herd should be selected from the litters of the heaviest weights in order to pick the most profitable breeding stock for the herd. Weighing the litter at weaning time is, therefore, very valuable in assisting to spot the profitable sow pigs. Gilts thus selected should be bred when about 8 months old, or so they will farrow when about 1 year old.

### SELECTING THE BOAR

Selection of the boar is more important than selection of the sows in view of the fact that his characteristics are transmitted to a majority of the pigs. A purebred boar will generally sire more valuable pigs than a grade boar because he represents generations of careful selection. Good points are emphasized and undesirable ones are reduced by the care given to selection and mating. Masculinity in the boar is just as important as femininity in the sow. The boar should be selected for size and vigor. The body characteristics valuable in the brood sow also are important in the boar.



Self-feeders are practical and economical.

## CROSS-BREEDING

Cross-breeding of all types of livestock has been given considerable study by various experiment stations during the past few years. There is evidence to support the idea that cross-breeding, when properly done, has a tendency to improve the vigor of livestock. Such a program, however, must be very carefully planned. Cross-breeding requires intelligent selection of both boars and sows. Experimental work tends to indicate that only purebred boars should be used and such boars should be selected as will cross to the best advantage with the characteristics of the sows in the herd. Under no consideration should cross-bred boars be used. Recent work in cross-breeding hogs for pork production has been carried on in Iowa and Minnesota with a considerable number of litters. It was found that cross-bred pigs were more vigorous than purebreds as shown by a larger percentage of those farrowed that lived to weaning age. It is well again to emphasize the importance of a very carefully planned program in this connection; otherwise there will be some disappointments.

## WELL-KEPT SOWS PRODUCE STRONGER LITTERS

A large percentage of the pigs marketed each year is produced by sows approximately 1 year old. Such sows are growing rapidly and developing their bodies while raising litters of pigs. For building both the bodies of the sows and the litters, minerals, considerable protein, and energy are needed. After the sow is mature, she needs less of the various ingredients than do the gilts in proportion to body weight.

Proteins are very important and can be supplied in the form of skim milk, buttermilk, tankage, fish meal, or other protein supplements.

Most of the grains when properly supplemented are satisfactory for feeding sows. Such a combination as 2 pounds ground barley or wheat; 2 pounds ground oats; and  $\frac{1}{4}$  pound meat meal (tankage) makes a very satisfactory ration. Another would be ground barley or wheat, 4 pounds; meat meal,  $\frac{1}{4}$  pound (or 8 pounds of skim milk); and alfalfa meal,  $\frac{1}{4}$  pound.

Sows carrying litters need a large amount of protein, especially during the last 6 weeks of pregnancy.

## GREEN LEAFY HAY EXCELLENT FOR SOWS

It is a good plan to feed all the hay sows will eat. There is nothing better than good leafy green-colored hay such as alfalfa or clover, as such hay contains more vitamins A and D. The hay can



be placed in a feed rack where the sows can help themselves to it. The amount of grain needed daily by yearlings or mature sows is about a pound for each 100 pounds of weight. A sow should gain, during the gestation period, from  $\frac{1}{2}$  to  $\frac{3}{4}$  pound per day unless she is more than moderately fleshy at the beginning. During the pasture season, sows and gilts should get half the allowance of grain necessary for winter feeding; that is, if they are running on good pasture like rape or some of the legumes.

### EXERCISE THE SOWS

Sows carrying litters should be required to exercise. It is well to feed the grain some distance from the sleeping quarters so that they are required to walk for it. Plenty of water should be supplied at all times.



A sow and litter in pen with electric brooder.

### KEEP RECORDS AND PLAN FOR FARROWING TIME

It is important to record the exact breeding date of the sow in order that proper attention can be given prior to the time the pigs are farrowed. The gestation period for a sow is 114 days. Sows may vary one way or the other, but the average is 114 days. Where sows are placed in new farrowing pens, they should be quartered

there several days in advance of the farrowing date so that they can get accustomed to the new quarters before farrowing time.

### THE SOW AT FARROWING TIME

The farrowing pen should be well bedded but not with too much straw or too long straw as the small pigs are likely to become tangled in it and be unable to escape from the sow. Chaff makes ideal bedding. The farrowing pen should be provided with a fender rail on three sides to serve as protection for the small pigs and keep them from being crushed by the sow. Such a fender rail may be made of a 2" x 4" mounted on wall brackets in a horizontal position so that the outer edge of rail will be 10 inches from the wall and 10 inches from the floor.

Small pigs do not need a large quantity of milk just after farrowing. This, therefore, calls for careful feeding of the sow prior to farrowing, and for several days after, in order that the milk flow be not stimulated too rapidly. The sow will get along best if she is not fed for 24 hours after farrowing but simply given water during that period. Thin slop during this period made from water with



First-prize Duroc barrow at the Oregon State Fair, 1940.



half bran and half shorts is an ideal feed. If the sow is hungry at farrowing time, there will be less trouble. After the first day start feeding the sow a slop with a double handful of grain twice daily and gradually increase her feed so she will be getting all she will take when the pigs are 2 weeks old. If the pigs scour, it probably is caused by too much feed. To correct this condition reduce the amount of feed to the sow until the pigs stop scouring, then gradually increase her feed. Handle the sows gently.

Many sows are ill-tempered, especially at farrowing time, and unless there is need for attention, the caretaker should let the sow and litter strictly alone; otherwise, she is likely to become restless and crush some pigs. If there is trouble at farrowing time, an experienced man, veterinarian or layman, should be on hand to remedy the trouble.

### **KEEP SMALL PIGS WARM**

When sows farrow in weather cold enough to chill pigs, it is a good practice to place each pig as soon as born in a barrel or box with some warm bricks in it, or better, a jug of hot water. If electricity is available, a very inexpensive pig brooder can be built and heated with electric lights. This arrangement serves the purpose very nicely in keeping the small pigs warm. They will soon learn to use the hover and thereby will stay out from under the sow. These brooders are the means of saving an average of one pig to the litter, according to trials at Oregon State College. As can be readily seen, the cost is soon made up in the saving of pigs. Electric pig brooders can be constructed for \$3.00 to \$4.00. See your county agricultural agent for further information.

### **CLIP THE SMALL BLACK TEETH**

There is usually considerable fighting among the pigs until each one gets located in the place where he always nurses. The baby tusks or needle teeth are long and sharp and are often the means of scratching the sow or the other pigs, thereby leaving dangerous sources of infection. Good hog men often make it a practice to clip these small teeth with cutting forceps or a pair of pliers.

### **YOUNG PIGS NEED GOOD CARE**

Mention has been made that the sow should be fed sparingly the first few days after farrowing in order to keep her from providing too much milk for the young pigs. It will be helpful if she is given 4 or 5 tablespoons of Epsom Salts in one feeding of the slop. The pens should be kept dry and clean, as wet pens tend to develop scours

in the small pigs. It is very helpful if direct sunlight can enter the pen. Small pigs require plenty of exercise to keep them from getting too fat. The first week or so they should be playing around the pen. They can be encouraged to exercise by throwing in newspapers to tear, or old rubbers with which to play. An alleyway in the farrowing house is an added advantage so that the pigs could use this runway once or twice a day. They can be driven back and forth if necessary. Sometimes small doors are made in the partitions so that the pigs will have access to the runway. Some breeders object to this practice, however, as the pigs are likely to become robbers and rob other litters of their feed. Under favorable weather conditions, especially sunshine, pigs are better off if they are allowed to go outside on clean ground.

### NUTRITIONAL ANEMIA

Pigs kept on concrete or wood floors without access to dirt are likely to develop anemia. This has sometimes been referred to erroneously as *thumps* and is due to a lack of iron in the blood. The hemoglobin of the blood decreases rapidly after birth and when the amount is low, the pigs grow weak and often this results in heavy loss. Symptoms are: harsh hair, short, difficult breathing with a jerky movement of the flanks, and a thickened, wrinkled appearance over the neck and shoulders.

One of the simplest ways of overcoming this difficulty is to throw in a shovelful every day or two of soil from a field where hogs have not been for one year, probably containing some grass roots that the pigs can feed on. This will provide them with the necessary amount of iron. Under unusual conditions, commercial iron sulphate (copperas) can be used. The copperas can be dissolved in water; this can be painted or sprayed on the sow's udder two or three times a week. This is a tedious treatment and for that reason this soil is much more practical and easier to administer.

### YOUNG PIGS MAKE CHEAPEST GAINS

As is true of all kinds of livestock, the young pig from the time it is dropped until the weaning stage, is putting on its most economical gains. Therefore, from the standpoint of profit in the business, it is important that utmost advantage be taken of this period. From the time the pig is weaned until it is ready to go to market, it is growing in size, and naturally more and more of its feed is required to maintain the additional weight put on. The good hog producer is one who plans his management in such a way that his pigs are ready for market by the time they are 5 to 6 months of age.

### CASTRATION OF SMALL PIGS

The most favorable time to castrate boars is before they are weaned. They will shrink less at that time than if one waits until after weaning. Warm, sunshiny weather is desirable, as are quarters free from dust or mud holes at the time castrating is done.

### WEANING THE PIGS

Pigs are usually weaned at an age of 55 to 60 days. Naturally, weaning under certain conditions results in a considerable setback. To avoid this loss of flesh and to keep the pigs gaining steadily is very important. The pigs should be eating well so that they will not have to get accustomed to feeds other than milk. From 5 to 7 days prior to the time the litter is to be weaned, it is well to cut the feed



Good pasture crops are a means of reducing grain required in making 100 pounds of pork.

to the sow so that her milk flow will be reduced. The pigs, therefore, should have more feed to allow for the shortage of milk. The protein part of the ration is especially important. The usual practice after weaning is to leave the pigs in the lot and buildings to which they are accustomed, at least for a few days, as this tends to keep

them from running around the fence and squealing as they are sure to do in a strange place.

After weaning, the sow should be given such a feed as oats, as this tends to serve better than corn or some of the other feeds in reducing the milk flow. Feeding the sow less than enough to satisfy her appetite will help to reduce the milk flow and thereby prevent damage to the udder.

The pigs that have been weaned, as stated before, have been deprived of a high-protein feed in the form of the sow's milk; they naturally must have some substitute, if they are to do well. If there is a supply of skim milk or buttermilk available, this is the time to feed it to the pigs, otherwise use some other animal protein, such as tankage or fish meal, to supplement the grain ration. At this time 12 to 14 per cent protein is required to keep the pig growing.

### VALUE OF PASTURES

Pasture crops are extremely important in reducing the amount of grain required to produce increased weight in the animals. There are many pastures that are satisfactory. Alfalfa is considered to be the best and the next would be rape and the clovers, aside from sweet clover. While sweet clover can be used, it is not considered as valuable as the other legumes. Other pasture crops that fit into the picture where legumes cannot be grown are grass pastures or even fall-sowed wheat or oats. Most any crop that will be green at the time of the year when pasture is desired will do. Where the sow is suckling her litter there is nothing better for her and the pigs than a good pasture.

The return from good pasture is estimated to be around 350 pounds of pork per acre. This naturally will vary considerably depending on the quality of the feed. Alfalfa, red clover, and other legumes will usually carry from 25 to 30 growing pigs per acre if the pigs get all the grain they want. For the larger pigs weighing from 80 to 125 pounds, the number of pigs per acre will naturally be reduced. Grass pastures and the other pastures mentioned would carry somewhat less than this. In handling alfalfa pasture it is found advisable to have the field divided into several lots so that the pigs can be shifted at different intervals. The pasture that has just been left should be clipped with a mower so that young tender shoots will again start. Where water is available, this is a good time to irrigate, thus starting the pasture along on its way so that it will be ready for use again within 10 days or 2 weeks. Hogs do much better on young tender shoots of alfalfa than on the older growth. This same general principle might also apply to other pastures.

## THE USE OF SELF-FEEDERS VS. HAND-FEEDING

As the pigs grow in size, they should be provided with a self-feeder in the hog lot as they are not likely to be getting enough milk at that time to take care of their needs for body growth.

At this stage in the game there is nothing better than skim milk or buttermilk. Hog men who have these available are indeed fortunate, as milk is a good growing feed.

There is some difference of opinion in the minds of hog growers as to whether they should hand-feed their hogs or use a self-feeder. More and more, however, they are coming to the opinion that the most economical gains are made where a self-feeder is used. This is due to the fact that there is less labor involved. Experimental results indicate that it requires less grain to feed a pig for market when he is fed through a self-feeder. The smallest amount of grain, in any event, that should be fed to a hog is about 2 pounds per hundredweight per day. By that we mean 2 pounds of grain to a 100-pound hog.

## GRAIN FOR HOGS SHOULD BE GROUND

The grinding of grain results in a saving of from 10 to 15 per cent as a rule, as the animal is able to digest the ground feed better. The grain, however, should not be ground too fine. Medium coarsely ground grain is preferable to very finely ground grain. This statement applies to all grain except corn, which can be fed on the ear or shelled. The ground grain works nicely in a self-feeder.

## DOES NOT PAY TO SOAK GROUND GRAIN FOR HOGS

The question is frequently asked as to whether or not it pays to soak or cook grain for hogs. Experimental evidence shows that it does not pay to do either one. The cooking of grain actually reduces its feeding value in that it destroys some of the food nutrients. The soaking of grain, on the other hand, is less objectionable, although the adding of the water does not seem to result in any saving of grain. Soaking ground grain may be convenient, especially in a windy country where it is likely to blow out of the troughs, but so far as adding anything to the feeding value, the wet grain is no better than dry grain. Soaking whole grain is not as satisfactory as grinding.

## FEED STUFFS FOR HOGS

Here are discussed the various feeds that are generally used in the Northwest for pig-fattening purposes. The results of experiments conducted in Oregon are given to substantiate statements made, and results from other states are cited when of sufficient pertinence.

**Barley.** Barley is the basis of all pig-feeding operations in the Northwest and thus has the same position in this section that corn holds in the Middlewest. The barley fed is of three kinds: common feed barley, hooded barley, and hull-less barley. The common feed barley is much more generally used than either of the other varieties. Barley that weighs 41 to 46 pounds per bushel has 95 per cent of the feeding value of shelled corn.

**Wheat.** This grain is used extensively in Oregon for fattening pigs and is commonly thought to be superior to barley, but in numerous experiments wheat has not given increases quite equal to barley. The difference is very slight, however, and generally they may be considered of equal value. The finish of hogs from feeding wheat is as good as or better than from feeding corn or barley.

**Corn.** For fattening purposes corn is approximately equal, pound for pound, to ground barley or wheat. The following table indicates the results obtained at Ohio and Missouri stations:

Station	Ration	Daily increase	Feed to produce 100 pounds increase
		<i>Pounds</i>	<i>Pounds</i>
Ohio.....	Ground corn 9, tankage 1	1.59	366
	Ground wheat 9, tankage 1	1.59	383
Missouri.....	Ground corn 10, tankage 1	1.51	480
	Ground wheat 10, tankage 1	1.60	469

The results at these stations show a slight advantage for corn in Ohio and for wheat in Missouri. In general feeding operations the relative prices of corn, wheat, and barley should determine the grain the producer should feed since their value, ton for ton, is practically the same.

**Wheat byproducts.** Middlings and shorts can be used as a partial substitute for barley whenever prices justify. Experiments at Corvallis indicate that a combination of one-third middlings or shorts and two-thirds barley will give just as good returns as barley alone, but middlings or shorts fed alone as a fattening ration have not been satisfactory, gains being very slow and amounts of feed necessary to produce 100 pounds increase being excessive. These feeds are not palatable when fed in large quantities and contain too much crude fiber. Bran is too bulky for a satisfactory fattening feed and can seldom be used economically.

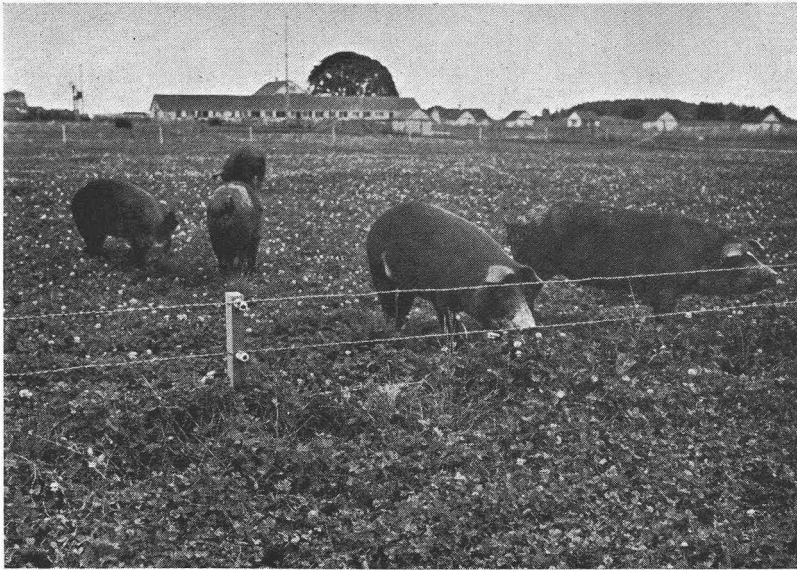
**Oats.** Owing to the bulkiness (high percentage of fiber) of this feed, it should not constitute the sole grain for fattening pur-



poses. Experiments at Corvallis in which one-third of the ration consisted of oats and two-thirds of barley gave results approximating very closely those given by barley alone.

Results at the Wisconsin Station in which one-third of the corn ration was replaced by ground oats indicate approximately the same relative values.

Ohio reports indicate with a similar ration a slightly smaller feeding value for oats than for corn. The difference is not great, however, and the feeder is fairly safe in making one-third of the ration oats provided the price of oats justifies the substitution. When fed in larger amounts than one-third of the ration, however, oats have not proved satisfactory.



Electric fence serves to hold hogs economically on pasture.

It should be noted that oats can be fed in a higher proportion to growing pigs before they reach the fattening stage. The fattening, however, should not be delayed after the pigs weigh 80 to 90 pounds. Oats are a very satisfactory feed for breeding stock.

**Rye.** Rye as a sole feed for fattening purposes is not palatable and does not give as good returns as other grains. Not only does it require more feed to produce 100 pounds increase, but gains are made less rapidly. It seems impossible to induce the animals to eat

sufficient quantities of rye to produce satisfactory increase. Rye-fed pigs were lacking very much in finish as compared with the other lots.

If a small proportion of rye is mixed with a larger proportion of other feed, the pigs will eat it satisfactorily and make good increase. Rye contains about the same amount of nutrients as wheat. The lack of palatability is the limiting factor.

**Peas.** Because of the prevailing high prices for peas, they are not generally used for hog-feeding purposes. They contain about twice as much crude protein as the cereals and are high in phosphorus and potash. Peas are more efficient when fed in combination with some carbonaceous feed, such as wheat, barley, corn, etc.

The most general method of feeding peas is the hogging-down system. The peas are allowed to get ripe, and the pigs are then turned into the field to do the harvesting. This system at the Union Branch Experiment Station gave an average daily increase of 1.52 pounds with an average production of 397 pounds of pork to the acre. The amount of pork produced to the acre is, of course, very largely determined by the yield of peas. The returns are generally satisfactory considering the fact that peas are essentially a rotation crop and that pigs under this system do their own harvesting.

**Skim milk.** This is not only the very best supplement for growing pigs, but is of almost equal value for fattening purposes. Though very low in dry-matter content, milk furnishes a complete protein, which accounts in a large measure for the excellent returns. Milk renders the ration more palatable, inducing greater consumption and consequently greater daily gains. Also milk is a good source of minerals.

Tests indicate that where 3 or 4 pounds of milk are fed to each pound of grain, it will require 400 pounds of milk to replace 100 pounds of grain. Where milk is fed alone, increase in weight will be quite slow, and it will require 1,000 to 1,500 pounds of milk to replace 100 pounds of grain.

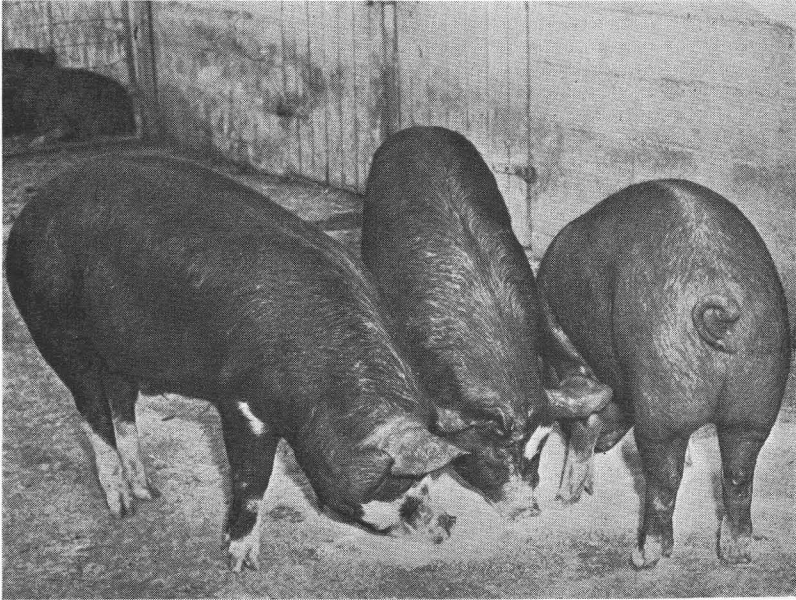
FEEDING VALUE OF SKIM MILK\*

Pounds of skim milk to grain	Amount of skim milk to replace 100 pounds of grain
	<i>Pounds</i>
3 pounds of skim milk to 1 pound of grain .....	325
5 pounds of skim milk to 1 pound of grain .....	450
7 pounds of skim milk to 1 pound of grain .....	575

\* Feeds and Feeding, by Henry and Morrison.

**Buttermilk.** This supplement when free from wash water is equal in feeding value, pound for pound, to skim milk. As with skim

milk, it should be fed at not more than 3 pounds of buttermilk to 1 pound of grain in order to attain the greatest efficiency. If buttermilk is diluted, a correspondingly increased quantity should be fed. Before paying a price for buttermilk equal to that of skim milk, the purchaser should be sure that the buttermilk is not diluted. It is a very easy matter to dilute buttermilk with water and the dilution is very difficult to detect unless a moisture determination is made.



Three modern-type market hogs.

**Whey.** While whey is a dairy byproduct and usually thought of in connection with skim milk or buttermilk, it is very low in protein content. The protein present, however, is very efficient and when fed to fattening pigs will balance a ration of barley or wheat. Whey does not contain enough protein to balance a ration for growing pigs. For growing pigs, about 3 to 4 pounds of tankage should be fed to 100 pounds of grain together with all the whey they want.

Whey has a value of about one-half that of skim milk or about one-eighth to one-twelfth the value of grain. Skimmed whey has slightly lower value.

**Tankage.** Tankage, often called meat meal, is a byproduct of the meat-packing industry. Waste meat, scraps, blood, and fat trim-

mings are subjected to a very high steam pressure and thoroughly cooked. The fat is then drawn off and the residue dried, finely ground, and placed on the market under the name of Digester Tankage. There are different grades of the product, containing from 40 to about 60 per cent protein. It is always advisable to use the grade containing the highest percentage of protein, as the value of tankage is mainly in its protein content. In general there is no advantage in using tankage in combination with skim milk or other protein supplements of animal origin. Less tankage should be fed with barley to pigs on alfalfa pasture. About 5 pounds tankage will balance the ration under these conditions.

Tests at the Corvallis station show that 100 pounds of 60 per cent tankage replaced nearly 300 pounds of grain. Besides these, eight tests conducted at the Union Branch Experiment Station show that 100 pounds of 60 per cent protein tankage replaced 327 pounds of grain.

These results indicate clearly the value of tankage as a protein supplement to the grains. They also indicate the inefficiency of grain alone. One pound of tankage fed in amounts of from 5 to 7 per cent of the ration will in general replace 3 pounds of grain.

**Fish meal.** Fish meal is a protein supplement prepared from fish scraps and fish unsuited for human food. The fish and scraps are cooked, then pressed to express the oil, after which the residue is dried and ground.

Some fish meals contain from 2 to 10 per cent less protein than does tankage. The monetary saving in feeding fish meal in comparison to tankage is 9 per cent. The relative price of tankage and fish meal will determine which feed should be fed. Fish meal containing less than 45 per cent protein cannot be expected to be as efficient as the high-grade tankage.

## COST OF PRODUCING HOGS

A simple method of determining cost of production, which seems to fit all conditions throughout hog-producing territory in the United States, is to base the cost on the price of grain. During World War days the United States Department of Agriculture determined that whenever the selling price of 100 pounds of pork, live weight, on the farm, was equal to the cost of 625 pounds of grain, the numbers of hogs in the United States remained stationary. Whenever the proceeds from 100 pounds of pork were greater than the figure indicated, there was an increase in hog production, and when the proceeds were less than the cost of 625 pounds of grain, the hog

population decreased. This would indicate that the price of grain has a great effect on the cost of production and could easily be used as a guide in figuring cost of producing a market hog.

It only requires in the neighborhood of 450 to 500 pounds of actual grain to produce 100 pounds of pork. The figure of 625 pounds of grain, therefore, includes all overhead expenses, such as care of the sow and the boar, cost of equipment, interest, labor, etc., in addition to the grain actually used.

This would mean that if the cost of grain were 1 cent a pound, the selling price of 100 pounds of pork on the hoof, at the farm, would need to be \$6.25 in order to break even.

### DISEASES AND PARASITES

**Hog cholera** is a disease that sooner or later affects all hog-producing sections. The more hogs there are, of course, the more danger of heavy losses through spread of the disease. The hog cholera serum treatment is used during outbreaks of the disease, and sometimes the serum is given as a prevention where there seems to be danger of the disease causing trouble. The safest procedure in the case of a hog cholera outbreak or anything that makes the grower suspicious of a diseased condition, is to contact the state veterinarian or county veterinarian for his help and advice.

**Lice and mange.** A satisfactory way to control lice and mange is to spray or brush the hogs with crude oil, crank case oil, or some other cheap product. If a sufficient number of hogs is to be treated, they can be crowded into a small pen and the oil sprayed on them.

Spraying the pens with oil is a good practice as it controls dust and reduces the number of lice.

**Intestinal round worms.** "Thumps" in young pigs is generally caused by the larvae of round worms in the lungs.

Round worms can be controlled by following the system of sanitation developed in McLean County, Illinois, as discussed below. Ask your county agent for the U.S.D.A. bulletin on Round Worm Control.

### SANITATION

The best sanitation practices are to get the pigs and hogs out of filthy lots and to use clean pastures where hogs have not been run for a year. These practices pay big profits by helping to control disease and by having the pigs on green feed, which greatly benefits their general condition.

Hogs that are to thrive and make the most of their feed should be surrounded with good sanitary conditions. Old, infested hog lots and buildings are the source of much loss to the hog grower. Round worms can be avoided with the use of new ground and houses carefully scrubbed before the sows are placed in them. In other words, to follow the McLean County system of control, it is desirable to keep the pigs away from worm-infested lots or pastures until they average around 100 pounds in weight. After they attain that weight, they are not seriously affected by round worms.

Farrowing pens should be thoroughly scrubbed and cleaned with lye and boiling water to be sure they are free from worm eggs before the sow is placed in them to farrow. Before putting the sow in the clean pen, the dirt should be washed from her udder with soap and warm water. This will reduce the danger of infestation from worms and the pigs will get off to a much better start. The sow and pigs should not be turned out in the old hog lot but taken to a pasture where no hogs have been kept for one year. They should not be driven through the old hog lot, or where hogs have been running, on the way to a clean pasture.