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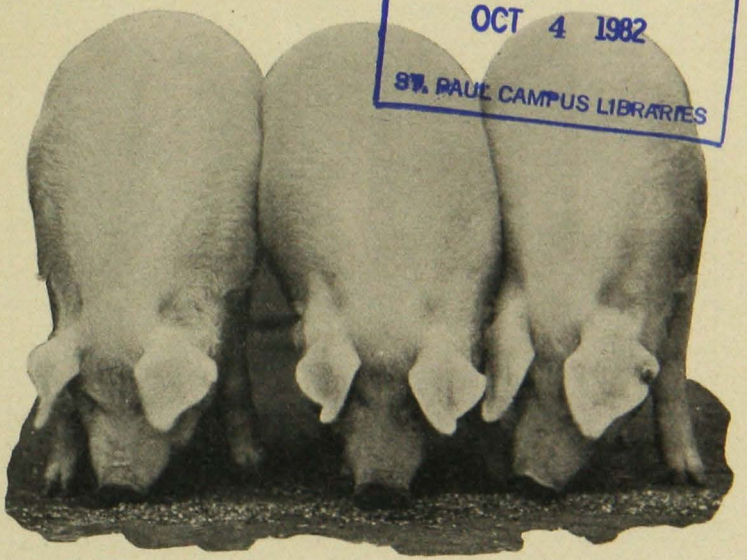
Care and Feeding of Swine

E. F. FERRIN
DIVISION OF ANIMAL HUSBANDRY
AGRICULTURAL EXPERIMENT STATION



CHESTER WHITE BARROWS
Grand champion pen over all breeds at International Livestock Show in 1927. Exhibited by the University of Minnesota.

UNIVERSITY OF MINNESOTA
AGRICULTURAL EXTENSION DIVISION

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HINTS FOR HOG PRODUCERS

Good breeding is essential to profitable hog raising, but proper feed and care are fully as important.

Corn alone is a high-priced feed. Protein and minerals must be added to make an economical ration.

Skimmilk and buttermilk are two of the best protein supplements. Ten pounds of either feed is approximately equal to one pound of tankage.

Alfalfa is a valuable feed both as pasture and as hay.

Bluegrass in early spring and late fall is good hog pasture. In the dry summer months it is mostly a gymnasium.

Alfalfa, red clover, and rape are the best hog forages.

Hog cholera causes the heaviest losses from disease. Serum and virus will protect pigs for life.

Unthrifty pigs usually are infested with worms. The clean-ground plan gives pigs a chance to make hogs of themselves.

Market the pigs when there are few on the road to market.

CARE AND FEEDING OF SWINE

Favorable conditions for the production of hogs in Minnesota have resulted in a steady increase in numbers during the last thirty years. Hogs now rank second only to dairy cattle in contributing to the farm income. During the last three years (1929-33) approximately 4,000,000 hogs have been marketed annually from the farms of Minnesota. A lack of feed crops usually results in reduced farrowings, and the production of large crops of corn nearly always means quite an increase in hogs the following year. Two factors of the feed supply have contributed materially to the increase in hog raising—the increase in corn production and the large quantities of skimmilk and buttermilk available as hog feeds.

Few sections of any state can market corn in the form of pork more profitably than southwestern Minnesota. Each pound of the fat hog represents from four to five pounds of grain and can be transported to market more cheaply than can the grain. Small grains, chiefly oats and barley, are satisfactory hog feeds in parts of the state where corn is not grown in large amounts. Skimmilk and buttermilk are outstanding protein feeds and much of the large quantities produced in the state must be fed to hogs in order to be utilized.

There are many market outlets both within and without the state that provide the competition necessary to obtain the highest prices. South St. Paul is one of the leading markets in the United States in handling fat hogs and feeder pigs. The health and thriftiness of Minnesota hogs make them in demand by packers and by feeders who purchase pigs for re-stocking feed lots.

SELECTING BREEDING STOCK

The foundation of profitable hog raising is wise selection of the breeding stock. While there are considerable differences between hogs of the leading breeds, there is greater variation within each breed. There are profitable and unprofitable hogs in every breed, so the choice of a particular breed is of less importance than getting the right kind of breeding animals, whatever the breed may be. Consumers of pork call for cuts of light weight with a high proportion of lean to fat. To supply these, hogs must be well finished at approximately 200 to 225 pounds. Therefore late-maturing breeding stock is undesirable, as pigs of this type will not fatten at light weights. It is not necessary to choose breeding stock of small size in order to get early maturity, altho it is difficult to combine large size with the ability to fatten quickly.

Brood sows should be selected upon the basis of utility, emphasizing points that indicate profitable production. A long body with well proportioned depth and width is desirable, as long-bodied sows usually farrow larger litters than short, thick ones. The back should be strong, with a fairly well developed arch, but an excessive arch is accompanied by shallow hams and chest. The hog is a machine used to turn grains into pork, and to accomplish this economically a strong constitution and good feeding ability are necessary. A deep, broad chest, showing good width between the fore legs, indicates strength of constitution; width of body with deep sides and low flanks provides needed space for the digestive organs. Strong feet and pasterns are important, as producers lose thousands of dollars yearly because many hogs arrive at the markets in a crippled condition. Much of this loss can be prevented by selecting breeding stock with strong bone and short, upright pasterns. To raise a large litter, a sow must have a well developed udder with from 10 to 12 sound teats, as each pig has his own feeding place. Inverted or blind teats are fairly common and all sows, especially those kept to farrow their first litters, should be examined carefully, eliminating those that have this defect. A feminine sow, one with a neat head and neck, usually will be a good mother; a coarse, staggy head is an indication of poor maternal characteristics.

Quality refers to points that show smoothness and other desirable features of the carcass. Fine hair, a skin free from wrinkles, neat ears, and clean bone indicate high quality in hogs. The butcher class of pigs, which sells at the top of the market, is made up of light-weight barrows and gilts outstanding in quality. To obtain good quality in market hogs, breeding stock that is coarse, wrinkled, soft, and flabby must be avoided.

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.

The selection of the boar is more important than that of the sow, as his characteristics are transmitted to a large number of pigs. As a rule, a purebred boar will sire more valuable pigs than a grade, because he represents generations of careful selection and feeding. Good points are emphasized and undesirable ones are reduced by the care given to selection and mating. Size, vigor, quality, and the body characteristics valuable in the brood sow are also important in a boar. Masculine sires are as important as feminine sows, for this is some assurance that the good points will be transmitted to the offspring.

FEEDING AND CARE OF BROOD SOWS

A large percentage of the pigs marketed each year is produced by sows approximately one year old. They are growing rapidly and developing their own bodies while raising a litter of pigs. For building both the bodies of the sows and their litters, considerable protein, minerals, and energy are needed. Mature sows need less feed in proportion to body weight. Grains, especially corn, are low in body-building substances and high in fat-making materials. In order to furnish the necessary protein and minerals, skimmilk, buttermilk, tankage, alfalfa hay, or other supplements should be added to grains. Mixtures of protein feeds usually are more valuable than single feeds because the lack of quality of the protein of one feed may be made up by another.

A few satisfactory rations for wintering bred gilts are listed. These suggestions are based upon the daily amount of feeds for a 200-pound sow.

1. Shelled corn 2 pounds; oats 2 pounds; alfalfa hay one pound.
2. Ground barley 2 pounds; ground oats 2 pounds; alfalfa hay unlimited.
3. Shelled corn 3½ pounds; tankage or meat meal ¼ pound; alfalfa hay one pound, or, skimmilk[1] 3 pounds.
4. Ground barley 4 pounds; tankage or meat meal ¼ pound, or, skimmilk[1] 3 pounds.
5. Shelled corn 3 pounds; skimmilk[1] 7 pounds.

Other combinations of feeds may be equally as satisfactory if the supply of protein is sufficient for body-building needs.

It is best to make the ration of home-grown feeds if possible; hence grain and either skimmilk or buttermilk, or grain and alfalfa hay, are preferred. Soybeans satisfactorily furnish a part of the protein needed by brood sows but should not be fed to fattening hogs, because the beans may produce soft carcasses. Fine, leafy red clover hay can be substituted for alfalfa, but sweet clover is not so good. Pregnant sows should always receive a good supply of protein, as rations lacking in this muscle-building food are likely to produce small litters of weak pigs. **A little money spent to put the necessary protein in brood-sow rations will give big returns.** The demands for protein are greatest during the last six weeks of pregnancy.

The amount of feed to be given daily can be estimated by the gain in weight and the appearance of fattening as the gestation period progresses. A growthy gilt can average about one pound of gain per day without getting too fat. Older sows use less of their feed for body growth, consequently fatten more readily. A reasonable amount of fat is an asset when sows farrow, as it is used for milk production, but over-

[1] Buttermilk is equivalent to skimmilk.

fat brood sows are lazy and often careless of their pigs. Farrowing troubles also are more frequent with fat sows than with thinner and more vigorous ones. It is never a good plan to keep young and old sows in the same lot, because the older ones will take most of the feed and otherwise impose upon the gilts.

Yearlings and older sows, which have made most of their growth, need less protein than the rapidly growing gilts, which reach only about half their mature weight at 12 months of age. Grain and good alfalfa or clover hay make a satisfactory ration, but the sows should not be fed all the grain they will eat. A mixture of grains—corn and oats, barley and oats, or corn and barley, furnishes a better supply of protein than one grain only. It is a good plan to feed all the hay the sows will eat, regulating the amount of grain by the condition of the sows. It should not be expected that the sows will eat the stems of the hay; therefore the greenest and most leafy hay is the best. It can be fed in a rack, but this is not necessary unless the ground is muddy. The amount of grain needed daily by yearling or mature sows is about 1½ pounds for each 100 pounds of weight. A sow should gain from ½ to ¾ pound per day unless in more than moderate flesh when bred. During the pasture season, bred sows and gilts will need about half the allowance of grain necessary for winter feeding, if good legume or rape pasture is available. A strong, vigorous condition resulting from good feeding and plenty of exercise is necessary for the farrowing of healthy, active pigs.

Exercise is fully as important as feed. Brood sows usually will not take enough exercise during the winter unless forced to hunt for a part of their grain in fields. If snow covers the ground the grain can be fed some distance from the sleeping quarters. Water should be supplied at least twice daily or, better still, be available from a constant supply. An animal needs several times as much water as feed.

Mineral mixtures are needed by hogs that do not have good pastures. Brood sows, especially, need minerals in larger amounts than furnished by most feeds, because grains are low in bone-building compounds. Only a small percentage of the minerals of plants is found in the seeds. Common salt is necessary, and is most satisfactorily given by supplying a mineral mixture or by keeping salt before the hogs. Hogs fed corn in dry lots are likely to need calcium, as corn is low in lime and fairly high in phosphorus. The area surrounding the Great Lakes is low in iodine, and cases of goiter in pigs are found occasionally. It is good insurance to feed potassium iodide to pregnant sows during the winter at the rate of one grain per sow daily if iodine is not fed in a mineral mixture. One of the commonly used mineral mixtures consists of 20 parts common salt, 40 parts finely ground high-calcium limestone, and 40 parts feeding-grade bonemeal. To each 100 pounds should be

added about 5/100 pound of potassium iodide, unless iodine is fed in another way.

Mineral mixtures are usually self-fed but may be added to the grain ration or hand-fed at intervals of from three to five days. The amount of a mineral mixture needed by hogs varies with the age, the kinds and amounts of grains fed, and different conditions of feeding. Sometimes a rate of feeding of one pound per month per head, or one pound of mineral mixture for each 100 pounds of other feeds, is followed. Hogs get most of the minerals they need from ordinary feeds and a shortage is more likely to occur in dry-lot than in pasture feeding.

Lice and mange cause considerable loss of flesh unless kept under control. These parasites have more opportunity to develop in winter than at other seasons. Crude oil is an effective treatment for lice but not so satisfactory for eradicating mange as lime-sulphur dip. Hogs should not be oiled in either very warm or very cold weather, as it may cause a considerable change in the body temperature. Oil drained from the crank cases of autos and tractors can be used as a substitute for crude oil, but must be applied more frequently. Hogs will usually oil themselves if a rubbing post is kept in working condition in a lot where they can get at it. Lice are found chiefly about the neck and jowl; mange affects the lower parts of the body, especially around the flanks and between the legs.

In summer, the most effective treatment of pigs for mange is dipping in lime-sulphur solution twice within a ten-day period. It may be necessary to repeat the treatment as the parasites are harbored in the sleeping quarters. Thoro cleaning and spraying of the barns or sheds should accompany the dipping of the pigs. If dipping cannot be done, hogs can be sprayed with the lime-sulphur solution, but care is necessary to reach the parts of the body between the legs. Lime-sulphur dip is prepared by combining 16 pounds of hydrated lime with 24 pounds of sulphur for each 100 gallons of water. Since it is necessary that the lime and sulphur be thoroly mixed and boiled with a part of the water for at least two hours, it is usually more convenient to buy the preparation ready-mixed and follow the directions for dilution.

Preparation for Farrowing

It is necessary to have a breeding date to know for certain when a sow is due to farrow. The average length of the gestation period is 114 days but pigs sometimes are farrowed as early as the 110th day or as late as the 120th day. Many pigs are lost each season because no breeding dates are kept and the pigs are born unexpectedly in an unsatisfactory place. Good results are obtained only by having a separate pen for each sow. The sow should have sev-

eral days to get accustomed to the farrowing pen before her litter is born, else she is likely to be restless and kill some of the pigs. **A fender placed about 10 inches above the floor and 8 inches from the side walls saves many pigs from being crushed.**

A large quantity of bedding, especially if it is long hay or straw, is dangerous for small pigs as they may get entangled in it and the sow may trample the pigs or lie on them. Chaff or shredded corn stover makes good bedding.

Care in feeding a sow for a few days before farrowing and several days after will avoid several common troubles. One of the principal points is to avoid constipation and to prevent a feverish tendency. Very little grain should be fed, but the appetite of the sow can be satisfied by slop made of water and a mixture of half bran and half shorts. By keeping the sow a little hungry rather than giving her all the feed she wants, trouble at farrowing time may be avoided.

Some sows are naturally bad tempered near farrowing time, but the disposition is influenced largely by the methods of feeding and handling. A quiet, competent caretaker is rarely chased out of the pen. Rough treatment increases the tendency for the sow to be cross. A small hand hurdle carried into the pen when a sow is inclined to be mean protects the man and allows him to do necessary work without starting a fight with the sow.

In most cases no aid is needed when the sow is about to deliver her pigs. A skillful herdsman is careful not to disturb the sow or let other hogs make a disturbance near the farrowing pen. If, after several hours, the sow seems unable to farrow her pigs, an experienced man—veterinarian or layman—should be on hand to remedy the trouble.

When sows farrow in weather cold enough to chill the pigs, it is a good practice to place each pig, as soon as born, in a barrel or box with some warm bricks or a jug of hot water. When all the litter has been farrowed, or sooner, if several hours elapse, the pigs should be helped to nurse, seeing that each pig gets some milk. A little milk in a pig's stomach does wonders to put life and energy into it. Except in very cold weather, or if the sow is restless and gets on her feet often, the pigs should be left with her. Small pigs nurse frequently, so unless they stay in the pen with her they must be put with the sow about every three hours both day and night.

Sometimes there is a good deal of 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 pointed and the pigs may scratch each other about the face or worry the sow so that she will not nurse the pigs well. If this happens, the ends of the tusks should be clipped off, using care not to splinter the teeth or injure the gums, as this will open

up a way for germs to start an infection. A pair of small cutting forceps is the best tool for this job, but pliers can be used if nothing better is at hand. There is no need to clip the teeth if the pigs get adjusted quickly; thus chance of infection will be avoided. Ulcers about the mouth are caused by infection of pus-producing germs and it is advisable to examine the pigs every few days during the first month to recognize the early symptoms. If treatment is begun early, a solution of potassium permanganate is very effective. Dissolve fresh crystals in warm water, making enough of the saturated solution so that the heads of affected pigs may be quickly dipped in the liquid. If two or three treatments given upon alternate days do not check the ulcers, a stronger agent such as a 3½ per cent iodine solution can be applied after the scab is removed.

The sow will get along best if she is not fed for 24 hours after farrowing, but water should be given. Feeding for the first few days should be limited to a little grain and considerable slop containing a good deal of bran. Milk production should not be stimulated for a week or ten days, but bulky, laxative feeds should be given. Oats are more bulky and less heating than corn. "Spare the feed and save the pigs" is a good rule for the first two weeks.

Care of Sow and Small Pigs

A good brood sow, unless fed carefully, will produce too much milk for her pigs at first and the litter may develop scours. If this happens, each pig should be given a teaspoonful of mineral oil. This is most easily administered with an open glass tube, keeping a finger over the upper end and putting the oil slowly upon the back of the tongue. A short piece of rubber tube at the lower end will prevent breaking the glass. The sow should be fed sparingly and it will be helpful if she is given from 4 to 5 tablespoonfuls of Epsom salts in the slop. Damp pens and cold rainy weather are favorable to the development of scours. Sunshine is very helpful in drying the floor, and the pens should be cleaned frequently and the bedding kept dry.

Pigs must have exercise to prevent them from getting fat. By the time they are a week old they should be playing around the pen and can be encouraged to exercise by giving them newspapers to tear or old rubbers to play with. If the farrowing house has an alleyway, the pigs should use this for a runway once or twice a day. If necessary, the pigs can be driven back and forth so that they will get the needed exercise. Sometimes small doors in the front of the pens are used to allow the pigs to run in and out while keeping the sow confined. An objection to this practice is that some pigs become robbers, sucking sows that are not their mothers. When the weather is favorable the pigs should be

outdoors if they can be kept from lots contaminated with worm eggs and "necro" germs.

Pigs that do not have access to the soil are susceptible to anemia, formerly called "thumps." The hemoglobin of the blood decreases rapidly after birth, and when the amount becomes low the pigs grow weak and some of them may die. The symptoms are harsh hair; short, difficult breathing, with a jerky movement of the flanks; and a thickened, wrinkled appearance about the neck and shoulders. Milk is low in iron and the normal amount cannot be increased by feeding iron compounds to the sow. Commercial iron sulphate (copperas) can be used to drench the pigs but drenching is a tedious process. It must be done every two or three days and there is some danger of getting the liquid into the lungs. Of many methods that have been tried, the most logical one seems to be to give the pigs dirt that has been sprinkled with a solution of copperas. As much of the fresh crystals as will dissolve is stirred into warm water. Pigs when only a week old will nose about and eat dirt and a small amount will prevent serious cases of anemia. If some litters of pigs do not have an appetite for dirt, the udders of the sows should be swabbed several times daily with the copperas solution. Anemia ceases to be a problem when pigs are old enough to eat feeds that supplement the low-iron content of milk.

WORMS

The round worm is one of the most serious handicaps to pig raising. Nursing pigs may get the eggs of round worms from the udder of the sow, the floor of the pen, or the soil of the lot. Lots about the barnyard usually are badly contaminated with worm eggs ready to hatch. If the eggs are taken into the digestive tract, the worms develop quickly and migrate, in the blood stream, as parasites of microscopic size, frequently locating in the lungs. Here they stay for a time. They result in injury to the tissues and cause the pigs to cough. As the worms grow they are coughed up or work their way to the mouth, when they are likely to be swallowed. Reaching the small intestine, the worms continue to develop, and, if numerous, cause a serious loss of flesh and of growth. Losses due to worms are heavy unless a real effort is made to control them.

Brood sows nearly always are infested with round worms, and pastures and lots regularly used by hogs are badly seeded with them. From the time eggs are passed out in the manure, several weeks are necessary for the eggs to ripen so they will hatch. In cool weather the eggs develop slowly enough so that suckling pigs are not infested with worm eggs from the sow. Hogs over four months of age do not suffer much damage from these parasites, but young pigs are seriously affected. The

swine sanitation plan has given satisfactory results in preventing worm infestation of small pigs, as well as avoiding losses from germ diseases of the type termed "necro." This plan aims to keep the pigs until they are four to five months of age in clean surroundings, where they will have little chance of picking up worm eggs. Pastures where hogs did not range the previous year are provided and the sow and the little pigs are kept out of old hog lots. Farrowing pens must be thoroly cleaned and scrubbed with lye and boiling water to be sure they are free from worm eggs. The resistance of these eggs to ordinary disinfectants is shown by the fact that they will develop in a formalin solution. Before putting the sow in the clean pen, the dirt should be washed from the udder with soap and warm water. Both sow and pigs are kept in clean surroundings, which can be provided around a permanent farrowing house by putting down a narrow strip of concrete. By this means direct sunlight and exercise are obtained without risk of the pigs becoming wormy. Movable houses, if used for farrowing, need to be thoroly cleaned and put on fresh ground. When moving sows and pigs from a clean farrowing house to fresh pastures, they should be hauled and not driven through lots contaminated with worm eggs. **That the added labor necessary in following this plan is worth while is proved by the raising of approximately two pigs more per litter in many herds.**

The treatment of pigs for worms is usually necessary if the clean ground method is not followed. Before pigs are weaned, some of them are small, the head seems too large for the body, and the hair is harsh and wiry. A wormy pig coughs when he is disturbed and if the infestation is severe he has a pot-bellied appearance. The worms are very resistant to the action of vermifuges so that only the most effective agents must be used, and, even then, as strong a dose as the pig can tolerate is necessary to dislodge the worms. Probably there are few cases in which the pig is entirely freed from worms but great improvement results from one or sometimes two thoro treatments. Mixing a vermifuge with feed is not an accurate method of dosing, as the smaller, weaker pigs, which most need the drug, usually get only a little. Santonin and wormseed oil are common vermifuges. One gallon of castor oil plus 8 ounces of wormseed oil makes a total of 136 ounces of the mixture. The dose for a pig weighing between 30 and 40 pounds is one ounce. The pigs should be kept off feed but allowed water from 12 to 18 hours before treatment and from 8 to 10 hours afterward. A slop feed with a dose of Epsom salts, two or three tablespoonfuls per pig, is then given. The method of treating with worm capsules is preferred by some hog producers and is satisfactory if standard products are used. While being treated the pigs should be confined to a house or a feeding

floor so that the manure can be cleaned up to avoid re-infesting the premises. This treatment cannot be effective unless carefully done, and it is certain that if pigs remain wormy they will be unprofitable.

Prevention of diseases of the filth-borne type is necessary to profitable pig raising. There is no very satisfactory treatment for the diseased condition termed "necro," which manifests itself by ulcerated spots on the lining of the intestines. A related disease is sore mouth, or bull nose, appearing as ulcers about the jaws. Old hog lots badly infested with worms are in many cases dangerous also for pigs because many of these pus-producing germs are present. The clean-ground plan of raising pigs is the only one that can be followed profitably in event of serious contamination by these germs. Treatment of necro by the use of intestinal antiseptics has value, and the mouth ulcers may be readily healed if they are not deep-seated, but keeping small pigs free from these diseases is the only satisfactory plan.

FEEDING THE SOW AND HER FAMILY

The loss of live pigs farrowed amounts to from 30 to 35 per cent, most of this heavy tax upon the business coming within the first month. At the end of this time pigs have passed most of their hardest trials. The use of good pasture simplifies feeding and helps to keep up the milk flow of the sow. The pigs have a never-satisfied appetite and the sow shows a big shrinkage in weight. When the litter is on pasture, so the pigs have plenty of exercise, the most satisfactory plan of feeding is to allow both sow and pigs access to a self-feeder. Grain and wheat shorts are always good feeds to keep before the pigs and it is usually advisable to add tankage or another high-protein feed. The weight which a sow loses while suckling pigs must be made up later and it is a good plan to prevent excessive loss of flesh by self-feeding during the latter half of the nursing period.

Skimmilk and buttermilk are among the best of all feeds. Their greatest value is realized while pigs are growing rapidly, and one of these feeds should be fed whenever possible. It is immaterial whether the milk is fed in the natural state or mixed with other feeds to form slop. Young pigs make cheaper gains than older ones and it pays to start them well. In rainy weather there is some danger of scours, but this is not likely to happen if sudden changes in feed are avoided. Getting the pigs accustomed to feed so they do not depend entirely upon the sow results in rapid gains and makes weaning a simple process, accomplished without loss of flesh.

A good brood sow uses the feed she eats to produce milk and does not fatten while suckling pigs; on the contrary, it is hard to maintain her weight. Corn is the best grain if plenty of protein and minerals are

supplied by other feeds. If the more bulky grains, oats or barley, are fed in place of corn, more protein is supplied, but the sow may lose more weight. Many feeders prefer to use a mixture of grains such as equal parts of oats and corn or oats and barley. A rich slop made of shorts and 10 per cent linseed meal or tankage, mixed with water if milk is not available, helps the sow to produce milk.

CASTRATION AND TREATMENT TO PREVENT CHOLERA

The most favorable time to castrate male pigs is before they are weaned. They shrink less at this time, as they have the milk of the sow to depend upon, and the operation is accomplished with little shock and loss of blood. Warm, sunshiny weather is desirable, and quarters free from dust and mud holes will help a great deal to prevent infection and complications following castration.

Despite the almost certain favorable result of the serum-virus treatment, hog cholera still causes a greater loss of pigs than any other disease. This is because of the natural tendency of owners, when cholera has not appeared in the neighborhood for some months, to take a chance that it will not develop. In a section where hogs are raised in large numbers it does not pay to take this risk. Pigs are successfully vaccinated when from two to six weeks of age, at small cost, and if they are not protected with serum and virus at this time it may be necessary to treat them later at much more expense. The operations of castrating and vaccinating are best done before the pigs are weaned, but not at the same time. Dipping once or twice is advisable, especially if any lice are noticed.

WEANING PIGS

Sometimes weaning results in quite a set-back. To avoid this loss of flesh and to keep the pigs gaining steadily is proof of good management. First of all, the pigs should be eating heartily so that they will not have to learn in a few days to get accustomed to feeds other than milk. Pigs are weaned when from six to ten weeks of age but the usual time is about eight weeks. **From three to five days before the litter is to be weaned, the feed given the sow should be reduced.** By gradually cutting off the grain and reducing the slop, the sow will begin to dry up before the pigs are weaned. The pigs should have more feed to allow for the shortage of milk and the protein part of the ration is especially important. It is best to take the sow away from the pigs and leave them in the lot and buildings to which they are accustomed. Then they will not run around the fences squealing as they are sure to do if put in a strange place. Oats or barley

is a better grain feed for the sow than corn at this time. Less than enough to satisfy the appetite will help in preventing damage to the udder from the accumulation of milk. In some cases it may be advisable to let the pigs nurse once or twice, but the pigs will get along better if this can be avoided.

When feeding pigs that are being weaned, it should be remembered that they are deprived of a high-protein feed and some substitute must be given if the pigs are to do well. Slop feeding gives good results at this time, altho dry feeding involves less labor and is gradually replacing the older practice. If sows are to raise another litter they can be re-bred from three to five days following the weaning of pigs. It often is advisable to save the ones that have raised the best litters and put the others in the fattening lot.

SELECTING BROOD SOWS FOR HIGH PRODUCTION

It is just as important to follow breeding and selection for efficient production in hogs as in dairy cattle. There are boarder sows in all herds and there are profitable sows in most of the same herds. Culling the herd should be done on the basis of the pounds of pork produced per sow and not from the standpoint of attractive appearance. It is a simple matter to notch the ears of sows so that each one can be identified and to mark the pigs soon after they are born. At weaning time the weights of the different litters of pigs are taken at as nearly the same ages as possible. There is a greater difference in these weights per litter than is generally recognized. The weights of 24 litters of pigs when 56 days of age have been obtained from several hog producers in this state. Only litters numbering seven pigs or more at weaning time are included. The lightest weight was 184 pounds and the heaviest 464 pounds, a difference of 280 pounds. The most valuable of these sows was worth as much for producing pork as 2½ of the least efficient kind. It has been proved that the weight of a litter of pigs at weaning time is an accurate measure of the market weight. Therefore, it is an easy matter by keeping simple records to cull out the low-producing sows and retain the more efficient. Sometimes there will be accidents to pigs in a litter that should be taken into account, but both gilts and tried sows can be accurately selected on the litter-weight basis. The standard for a worth-while brood sow can be set at a litter weight of 225 pounds of pigs weaned at the age of eight weeks. The man who has been keeping from 10 to 12 sows in order to market 15,000 pounds of pork can just as well sell the same amount of product from 8 or 9 sows at a larger margin of profit.

PASTURES AND FORAGE CROPS

Good pastures not only reduce the cost of feeding pigs but help in controlling parasites because pasture lots can be rotated more easily than dry lots. While most of the nutrition problems of growing pigs are well understood, there are some things supplied by pasture that are difficult to furnish in dry-lot feeding. This is illustrated by the fact that most men are able to grow a much better crop of spring pigs than of fall pigs. Experiments at several stations have established a fair average return from good pasture or forage crops at 250 pounds of pork per acre.

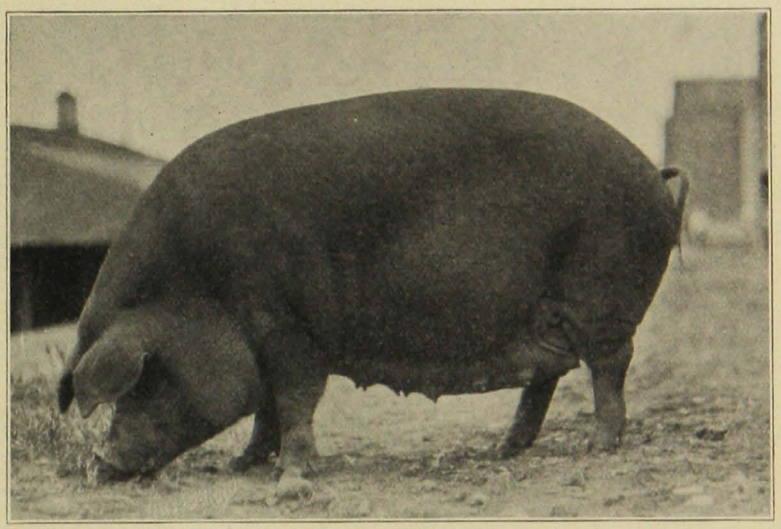

Fig. 1. The Right Type of Brood Sow
Grand Champion Duroc Jersey sow shown by the University of Minnesota at the State Fair.

The most common pasture crop in the cornbelt is bluegrass, which in early spring and late fall is a fine feed but in summer is worth little. By supplementing bluegrass pastures with rape or another temporary forage, good feed is available throughout the season. White pigs blister badly on rape, so alfalfa, a clover, or a mixture of several grasses will be more suitable for them. The number of pigs per acre of forage varies with the crop, the favorableness of the season, and the amount of grain fed. Alfalfa, red clover, or rape in good seasons will carry from 25 to 30 growing pigs per acre if the pigs get all the grain they want. On a part-grain ration the number of pigs will be reduced to about 15.

Fall-sown rye makes the earliest of all pastures but should be grown in combination with other crops as rye after reaching the joint stage is poor pasture. Small lots can be put in rye in the fall to be used during

April and May; then the ground is plowed and seeded to rape, sudan grass, or other forage. By doubling up in this way a great deal of feed can be grown on a small space.

Alfalfa is the best of all hog pastures. More pork per acre and more hay are obtained from alfalfa than from red clover, and both these crops give a larger total return than rape. All three crops are high in protein and minerals and reduce the amount of these high-priced supplements that must be purchased. Neither alfalfa nor red clover stand grazing well, but rape is hard to kill out during the one season of its use. Alfalfa is so valuable a feed that the hog producer in a region where the plant thrives should use it for pasture in summer and hay in winter.

Alfalfa cannot be pastured closely without killing it out, but the field can be divided into two parts, which are pastured alternately. One or two crops of hay are harvested, depending upon how heavily the pasture is stocked, and by having two separate fields there will be feed continually without damaging the new shoots. By this method the stand of alfalfa is preserved for several years and the pigs have fresh, succulent grazing without reducing the hay crop as much as if the alfalfa is left in one field.

Sweet clover is used extensively but is not very palatable to hogs. The crop grows rapidly and quickly gets too tough and woody to be eaten readily. It should be clipped back with a mower as often as it gets tall but even then it is not the best hog forage. Alfalfa, red clover, or rape will make more pork per acre by saving grain as compared with the amount necessary to feed hogs on sweet clover.

LIMITED FEEDING VS. FULL FEEDING OF GRAIN

The digestive system of the pig is not designed for the use of bulky feeds nor is its capacity great enough to allow for feeding at long intervals. Pigs gain more rapidly upon corn, if the ration is balanced, than when fed oats or barley. The difference is due primarily to bulk, altho corn is also more palatable. Growing pigs which must get most of their nutrients from pasture are not able to eat enough of this watery feed to make rapid gains and some of them are certain to become unthrifty. The smallest amount of grain which it is economical to feed is about a 2 per cent ration. This is 2 pounds of feed daily for each 100 pounds of weight of the pigs. On very limited grain feed, pigs not only gain slowly but are more susceptible to parasites and other diseased conditions than if well fed and vigorous.

Full feeding shortens the time of getting pigs ready for market and it allows finishing at desirable weights. There is a distinct

advantage in full feeding March-farrowed pigs as they are ready for an early market. **October prices average from 60 to 75 cents per hundredweight higher than December prices.** The reason why so many spring pigs are limited in feed during the summer is because the grain supply on the farm is exhausted and the owner does not want to buy more at comparatively high prices. It would be a more profitable plan for most hog raisers to carry over corn to feed during the summer instead of always being short of feed after the winter months. Of course, pigs farrowed late in April or during May cannot even by full feeding be ready for an early fall market, as it takes at least from five to six months to produce desirable market hogs. However, there is more loss from underfeeding the pig crop of the United States than from feeding grain too liberally.

If pigs farrowed in March are full-fed grain from the time they begin to eat, they will consume about three-fourths old corn and one-fourth new corn in reaching market weight. If limited to half-feed, about one-third of the gain in weight will be made on old corn and two-thirds on new corn. The cheaper price of new corn often results in a lower cost of gains when limited feeding is practiced, but the time of marketing may be decidedly unfavorable. The quantities of grain to produce 100 pounds of pork are practically the same for full feeding and for limited feeding because the smaller the grain allowance, the longer the feeding period. As long as most of the spring pigs are marketed in winter and fall prices are appreciably higher than winter prices, full feeding and early marketing of March-farrowed pigs will be profitable.

Self-feeding Grain

The plan of self-feeding allows pigs to satisfy their appetites at any time during the day and nearly always results in higher feed consumption and more rapid gains than other methods of feeding. Whenever maximum gains are desirable, self-feeding is an economical plan to follow but some limitations are to be recognized. The free-choice, self-feeding method allows pigs to eat whatever amounts they choose of several different kinds of feeds. It is not successful unless the feeds offered are of approximately the same palatability. For instance, corn and tankage are well adapted to this plan of feeding, but oats or barley and tankage offered free-choice often result in costly gains because the pigs are likely to eat more tankage than necessary. An unpalatable feed such as linseed meal may be self-fed by mixing it with tankage, but if offered free-choice little of it will be consumed.

Self-fed pigs do not make as much use of pasture as hand-fed pigs because they can get grain at any time. For maximum use of pasture

crops, feeds must be offered in limited amounts by hand-feeding. Self-feeders need daily attention to see that they do not become clogged or that feeds are not being wasted. In order to get pigs to graze more, self-feeders sometimes are located at the far side of a pasture but then more time is consumed in filling them and making certain that they are working properly.

Hogging-Off Corn

Turning pigs into a cornfield to harvest the crop is one of the most profitable ways of marketing corn. An early maturing variety is needed for hogging-off, as the most favorable time for this practice is in September and October. If fall rains are heavy or there are early snows, there will be some waste of feed so that small fields of corn that can be fed off in two to three weeks should be used. An acre of corn yielding 40 bushels of grain will feed 20 pigs averaging in weight 125 pounds for about 2½ weeks. To divide a field, a temporary fence of woven wire can be stretched between well anchored end posts and held in place by light stakes or tied to cornstalks.

Supplementary crops are often used in connection with corn, seeding them between the corn rows about the time of the last cultivation or growing the crop by itself near the corn field. Rape sometimes is broadcast ahead of the cultivator but when sown in this way some of the seed is covered too deep. If the seed can be drilled between the rows after the last cultivation of corn, a much better stand is obtained. Soybeans are grown more successfully as a separate crop than upon the same land with corn.

Since hogging-off is a method of full-feeding corn, some protein supplement is needed for most economical gains even if a good crop of rape or soybeans is also fed. **Tankage or other protein supplement will save enough grain to more than pay the cost.** Self-feeding the protein supplement is logical until the corn in a field is nearly used up, when the pigs will eat more of it than they need. It does not pay to make market hogs clean up every bit of the grain in a field, as their gains will be checked. Brood sows will salvage whatever feed remains and the exercise they get will be beneficial to them. Some of the fattening pigs will be ready for market when they have finished hogging-off corn, but most of them will need further feeding in a dry lot.

Fattening Hogs in Dry Lot

In fall and early winter, corn is cheaper than at any other season and the hog market takes a downward course. **The quicker the hog goes to market, the more profit he is likely to show.** Unless conditions are unusual and there is a probability of a higher market, full-feeding is the best policy. Oats are too bulky to fatten hogs quickly, but

small amounts, one-fourth to one-fifth of the total grain fed, can be used. Ground barley usually is worth from 90 to 95 per cent as much as shelled corn because it is a more bulky feed and is less palatable than corn. Feeding grain without a protein supplement produces slow and costly gains even if prices are low. If skimmilk or buttermilk is available at a low price it will balance the ration economically when fed in the proportion of three pounds of milk to one pound of grain. At normal prices tankage is one of the cheapest protein feeds and in periods of high prices the amount needed can be cut down by feeding alfalfa hay. However, alfalfa is too bulky to furnish all the protein needed to balance a full-feed of grain.

For a long feed in dry lot and especially as a supplement for feeding fall pigs, a mixture of two parts tankage, one part linseed meal, and one part alfalfa meal is very satisfactory. This mixture furnishes a variety of proteins and is reasonably high in minerals. Sometimes wheat shorts is cheap enough in price to compete with other feeds, but it is too low in protein to be used as the only supplement to grain for fattening hogs. The economy of feeding a protein supplement to fattening hogs has been shown many times by feeding experiments. The following table is calculated from the average results of fifteen comparisons of corn alone and corn plus tankage. The hogs weighing 148 pounds at the start were fed in dry lots for approximately 67 days. On corn as the only feed, the daily gain was 1.03 pounds per pig while the addition of tankage increased the rate of gain to 1.59 pounds. It took 617 pounds of corn without supplement to produce 100 pounds of gain but with 43 pounds of tankage only 400 pounds of corn were necessary.

Economy of Adding a Protein Supplement to Corn

Price of corn per bushel	Price of tankage per ton	Cost of 100 pounds gain	
		Corn alone	Corn plus tankage
$0.25	$30	$2.75	$2.44
.25	35	2.75	2.54
.30	35	3.31	2.89
.30	40	3.31	3.00
.35	40	3.86	3.36
.35	45	3.86	3.47
.40	45	4.41	3.83
.40	50	4.41	3.94
.45	50	4.96	4.29
.45	55	4.96	4.39
.50	55	5.51	4.75
.50	60	5.51	4.86

Unless the price ratio of grain to protein supplements is abnormal, it is expensive to keep hogs on unbalanced rations. Changes in grain prices bring a fairly prompt adjustment in the quotations for purchased protein feeds.

WHAT IS THE BEST MARKET WEIGHT?

For several years lard has been hard to sell because many lard substitutes have come into general use. The export trade in American lard has been a big factor in disposing of the product until recently when restrictions of foreign countries have practically closed the market. The average hog sold at a weight of 235 pounds yields about 35 pounds of lard. This is too much to sell at any advantage with the present state of the lard market. When the packers have to dispose of a large volume of lard at a low figure, the price of live hogs must bear this charge. Another important factor in the pork trade is the consumer demand for light-weight cuts. Pork loins weighing from 10 to 12 pounds and cured hams of from 12 to 14 pounds sell considerably higher than heavier cuts. Good merchandising requires the sale to the public of the pork products it wants because there are many other foods in competition with pork. The hog producer furthers his own interests if he supplies to the packer the kind of live hogs that make the pork products most in demand.

A hog must be at least reasonably fat to make a high quality of pork. Thin, unfinished hogs yield soft, flabby carcasses that sell at a low price. Both good finish and light weight of live hogs are necessary if the pork products are going to appeal to consumers. While top prices during recent months have frequently been paid for 160- to 180-pound hogs, the packer can use carcasses of hogs weighing up to 220 pounds to good advantage. It is probable that the type of hog that can be finished at weights of from 200 to 225 pounds will be most profitable to the producer.

The time of marketing may make a considerable difference in the returns from the hog crop. Avoiding as much as possible the months of heavy receipts is good business practice. Because of the declining price during the fall, it sometimes pays, even if plenty of corn is available, to sell pigs at lighter weights than to carry them from two to four weeks more and then market them at a lower price per pound. Sometimes pigs can be sold at 175 pounds weight with more profit than at 200 pounds. The 100 pounds of feed needed to make the additional 25 pounds of weight may cost more than the gain is worth.

To be desirable, the fat hog should be a meat carrier rather than the source of a large amount of lard. Lean meat is what the consumers want and it is a poor policy to feed hogs to the finish required a few years ago. All our meat animals are most economically marketed at an early age and in less than a fully finished condition. The hog should be so fed that he makes the speediest journey of them all from birth to the finished product.