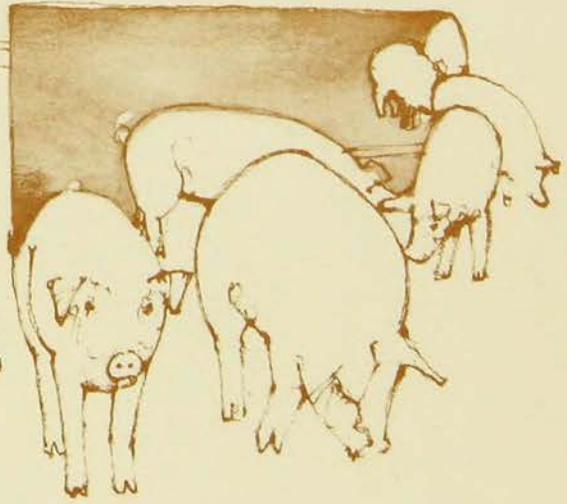
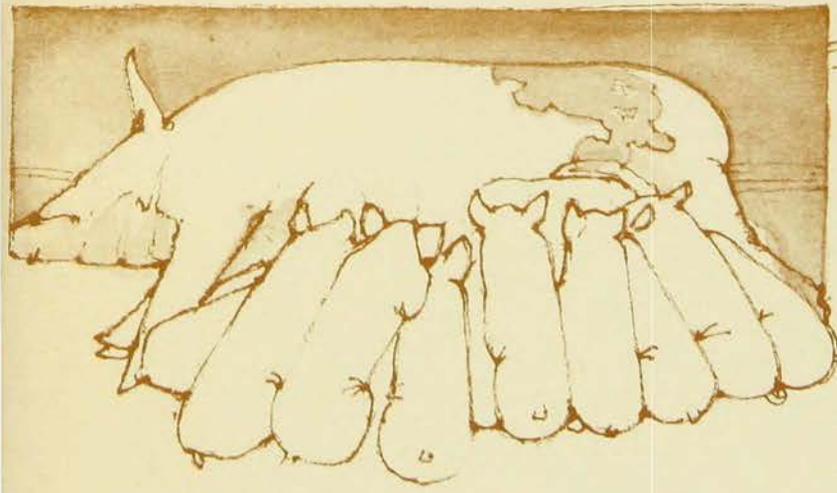


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swine production manual

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Extension Animal Husbandman
Agricultural Extension Service
University of Minnesota

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swine production manual

Charles J. Christians
Extension Animal Husbandman

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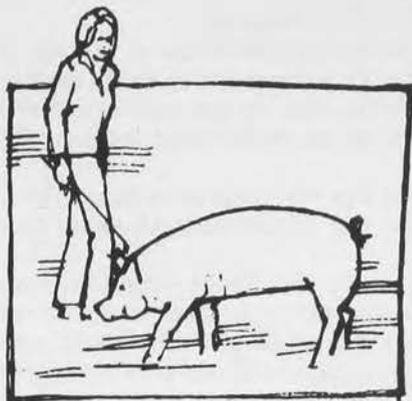
planning a swine program

Begin a swine program with the number of pigs for which you can adequately care. Increase the size of your program each year as you gain experience and have space available. Keep complete records on all pigs for program evaluation.

A market pig program may be started when pigs are between 2 and 2½ months old and weigh about 40 pounds. The pigs are then fed for an additional 3 to 3½ months until they weigh about 220 pounds. The pigs should reach this weight at 5 to 6 months, perhaps earlier.

In a breeding program, start with either a purebred or crossbred gilt or sow. A gilt may be reared and later mated and cared for through gestation and farrowing for the next year's program. A sow will usually cost more, but may raise several more pigs than a first litter gilt. The gestation period, the time from breeding until farrowing, is about 114 days. An additional 5 to 6 months will be needed for the pigs to reach 220 pounds.

Offspring from the breeding program may be fed in a market pig program, described above, or several gilts from the litter may be raised to build the breeding herd. If you plan to develop a breeding herd program, keep records on all the pigs in the litter.



selecting the animal

HOW MUCH TO PAY

The profit made raising a market pig is dependent upon the initial feeder pig price. If you paid too much, the pig has already lost some potential profit. However, a pig bought too cheap may not grow well or produce acceptable end product.

To determine how much to pay for a feeder pig, consider these points:

1. Initial pig weight. Remember, the less a pig weighs, the less it should cost per head, but the more it will cost per pound.
2. The expected market hog price on sale day. This is difficult to determine; it can only be an estimate. Guidelines to determine future hog prices can be found in many agricultural publications. This information will appear as actual predictions, trends in relation to current hog volumes and prices, and quotations on live hog futures trading. Your university extension service, swine buying stations, or auction market personnel can help you locate and interpret these reports.
3. The amount and cost of feed. Swine rations are usually developed around high energy feeds like corn or barley. Since this feed makes up about 80 percent of the ration and accounts for about 70 percent of the cost, it is reasonable to use corn price as a factor to calculate how much to pay for a feeder pig. If you use homegrown corn, use the current market price for corn. Contact your feed dealer about the price per hundred pounds of hog protein supplement and a complete feed.
4. Miscellaneous cost. This will include interest on money borrowed to buy the animals, death loss, trucking and selling charges, medication, and similar expenses. Such costs will vary considerably, but an allowance of approximately \$7 per head should serve as a guideline.
5. Satisfactory profit. A satisfactory profit will vary from one person to another and will also be determined by the current hog situation. As a swine producer, your goal should be to make \$5 to \$10 per head.

The maximum amount to pay for a pig to break even depends on the feed price (table 1, p 27). Remember your objective is to make a profit.

Using table 1, determine the maximum feeder pig price you can pay at a certain corn cost and projected sale price. If you expect the price of hogs to be near \$40 when you sell, and the price of corn is currently \$2.50 per bushel, then you should be able to pay \$30 for a 40 pound feeder pig and receive \$7 return for labor and facilities.

Breeding animals cost more than barrows because of their potential to reproduce offspring. A registered gilt will usually cost more than a crossbreed. Before you buy any pig, sow, or boar, check with several producers on their prices and their available performance records of gain, feed efficiency, and carcass merit. County extension agents and university livestock specialists have publications which list those producers who have top performance records.

IDEAL MODERN ANIMAL

The modern type pig is different from the pig raised 15 years ago. Today we emphasize and aim to produce market pigs and breeding animals which have rapid, efficient growth and yield a high percentage of muscle.

The leg, loin, picnic, and shoulder are the lean cuts of a pork carcass. A meaty hog weighing 220 pounds should have at least 42 percent in the ham and loin and a predicted 50 percent of muscle of the carcass weight.

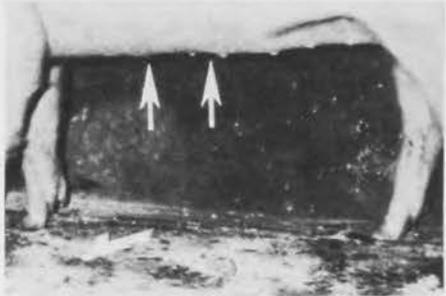
The most valuable wholesale cut on a hog is the ham. A soft, wasty ham on a meat hog is undesirable. The ham should be deep, long, thick, and firm. The ham should be wider than the back and should be thickest in the center and upper parts. The back should be generally curved, not too high, or flat. There is a slight ridge down the middle of the back of a heavily muscled hog. A countersunk tail and a flat, right angle back and loose fat at the base of the ham indicate fatness.

A full, clean turn over the top indicates muscling over the back and loin. While a sharp, narrow top reveals a lack of muscling, greater width through the back than through the ham indicates excessive finish. For a measure of carcass leanness, look at the loin eye area. Fat thickness is measured three-fourths of the distance over





Extremely prominent underline — seven teats showing — Extremely feminine nipples — starts extremely far forward.



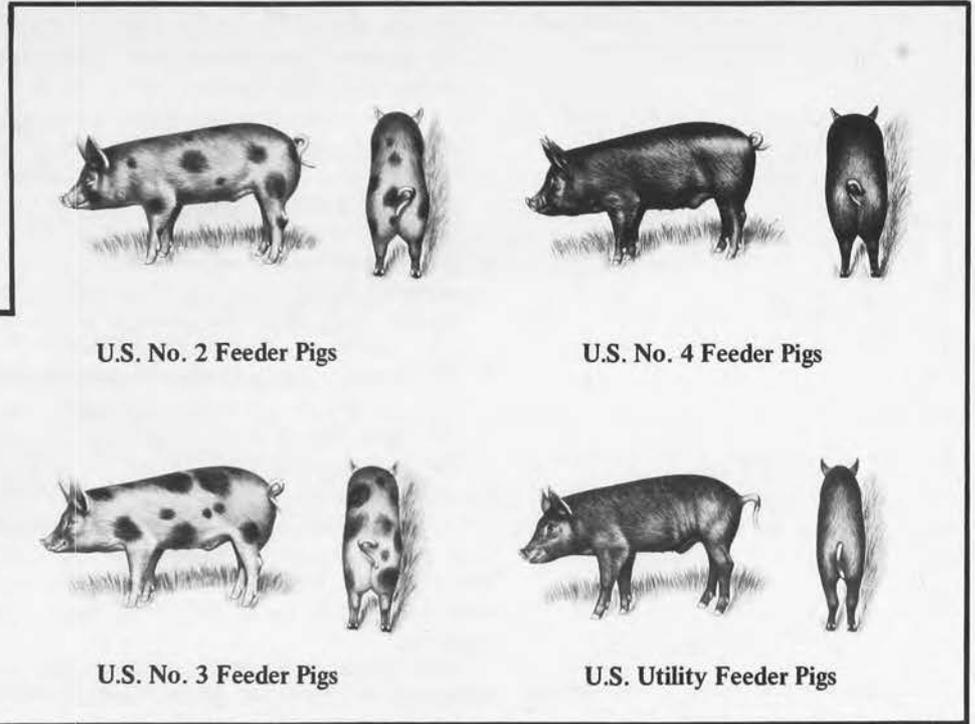
Front nipple inverted — Poor spacing of second and third nipples — First nipple definitely too far back.

the loin eye at the 10th rib. A desirable meaty hog should yield a minimum of 4.5 square inches of loin eye area with less than 1 inch of fat thickness.

Another measure of leanness is back fat thickness expressed as an average of measurements taken along the back of the live hog or at three points on the carcass: the first rib (over shoulder), the last rib (over loin), and the last lumbar vertebra (over rump). The most desirable amount of back fat on market hogs weighing 220 pounds is less than 1.3 inches.

Length is measured in a pork carcass from the first rib to the aitch bone. This is comparable to the front of the shoulder to the center of the ham. All meaty hogs should be more than 29.5 inches long.

The meaty hog should have moderate body depth. The flanks should be clean, free of wrinkles, and moderately deep. The underline should be firm, trim, and free from wrinkles. Gilts as well as boars should have at least six properly spaced, well-developed nipples on each side. Breeding animals exhibiting inverted or pin nipples are undesirable. Do not overlook sex and breed characteristics. A strong head with adequate sex character is desirable in breeding animals. A breeding gilt or boar should have structurally sound legs with adequate substance of bone.



U.S. No. 2 Feeder Pigs

U.S. No. 4 Feeder Pigs

U.S. No. 1 Feeder Pigs

U.S. No. 3 Feeder Pigs

U.S. Utility Feeder Pigs

When you buy a feeder pig, you should know the characteristics of a good pig. Knowing the various feeder pig grades and the description of each grade is essential to sound pig selection. Animal Science Fact Sheet No. 11, Feeder Pig Grading Standards, has a detailed discussion of the subject. (Copies of publications mentioned here are from the University of Minnesota, Bulletin Room, 3 Coffey Hall, St. Paul, MN 55108.)

U.S. No. 1 feeder pigs have long hams and shoulders and thick muscling. Their hams and shoulders are thicker than their well-rounded back. Feeder pigs in this grade are expected to produce U.S. No. 1 grade carcasses when slaughtered.

U.S. No. 2 feeder pigs are moderately long and have moderately thick muscling through the hams and shoulders. The back usually appears slightly full and well-rounded. This grade includes feeder pigs which otherwise qualify for the U.S. No. 1 grade but have less than moderately thick muscling and indicate more fat development. In this grade, feeder pigs are expected to produce U.S. No. 2 grade carcasses when slaughtered.

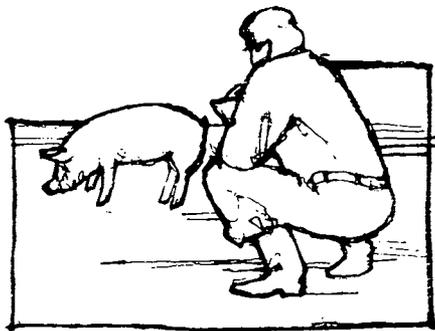
U.S. No. 3 feeder pigs are slightly short and have slightly thin-muscled hams and shoulders. Feeder pigs in this grade are expected to produce U.S. No. 3 grade carcasses.

U.S. No. 4 feeder pigs are short and have thin muscling throughout, particularly in the lower parts of the ham toward the shanks. The back usually is wider than the underline. Feeder pigs in this grade are expected to produce U.S. No. 4 grade carcasses.

U.S. Utility feeder pigs are small for their age and appear unthrifty. They often have a rough, unkempt appearance, indicating the effects of disease or poor care. The hams and shoulders are usually thin and flat and taper toward the shanks. The Utility grade feeder pigs may produce U.S. No. 1, U.S. No. 2, U.S. No. 3, or U.S. No. 4 grade carcasses when slaughtered at 220 pounds. If the unthrifty condition is not corrected, U.S. Utility grade feeder pigs will produce U.S. Utility grade carcasses.

U.S. Cull feeder pigs typically are very deficient in thriftiness because of poor care or disease. They can be expected to reach a normal market weight only after an extremely long and costly feeding period.

boar and gilt selection

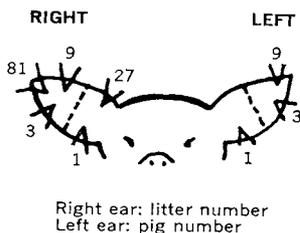


When you are buying a boar or gilt, think of the superior genetic material you are buying and not the price per pound.

Purchase your breeding stock only from those producers having performance records on their pigs. Place the greatest emphasis on traits that are highly heritable and which are the most economically important in your selection program (table 2, p 28). Those traits like carcass merit are highly heritable while reproductive traits are lowly heritable. Therefore, you will not make much genetic improvement if you select for larger litters. On the other hand, changes in carcass composition are relatively fast. A more comprehensive discussion of inheritance and how to predict genetic progress can be found in Extension Bulletin 353, Genetic Improvement Through Swine Selection. Write down your own minimum standards before you buy. If you can't find a boar or gilt that meets your minimum standards, consider another breed. To help in your program, consider the guidelines in table 3, p 28).

HOW TO SELECT GILTS FROM YOUR HERD

At your first marketing, don't sell all your fast-growing gilts but rather retain them as replacements. These gilts are probably the most sexually mature and healthy individuals which have the ability to grow rapidly. To help you choose the top gilts, set up your own on-the-farm gilt testing program. Follow this simple commercial gilt program:



Ear notch all gilts from large, uniform litters using the litter-pig identification system.

Select from sows with good dispositions and good farrowing ease.

Record birth date and farrowing information on a litter record card for each gilt marked.

Check gilt prior to ear notching for a sound underline, require at least 12 prominent nipples with at least three nipples in front of navel.

More complete records such as litter weights at birth, 21 days, and at weaning may be useful.

After weaning, place gilts on a full feed of high energy ration. They could be group fed by litter or sire progeny groups.

Weigh all gilts at about 175 to 200 pounds.

Probe or scan for backfat at the same time.

If gilts were separated by sire or litter groups at weaning and fed together, feed conversion can be measured.

Adjust all information to 230-pound basis.

Rank gilts on rate of gain and backfat information.

Evaluate for reproductive and structural soundness.

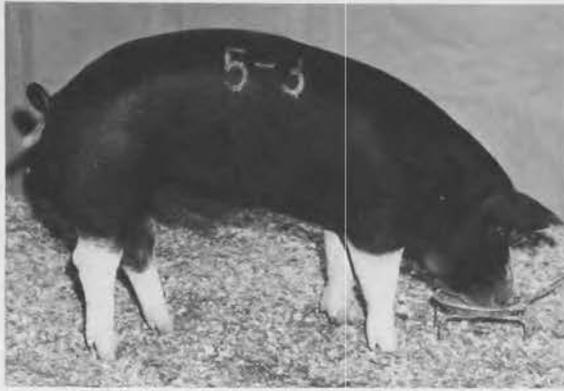
Select top gilts by elimination process.

Retain a few extra gilts if your operation permits. This allows for problems which may occur during breeding and gestation phase.

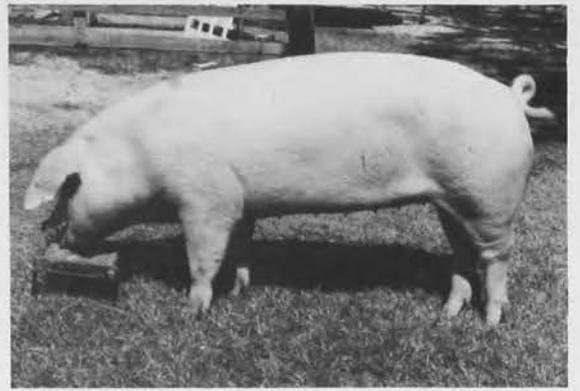
Send remaining nonselected gilts to market and get carcass data.

Record data on litter record card for future selection information.

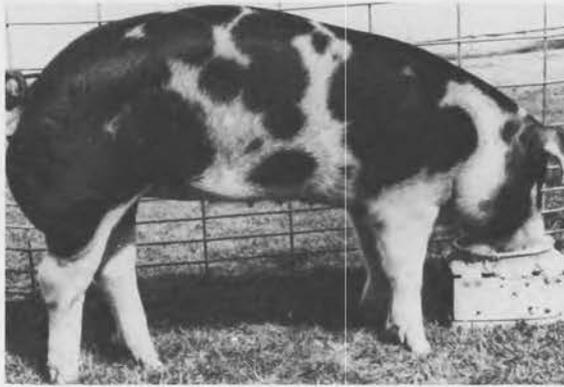
This information provides a method to select gilts for annual herd improvement.



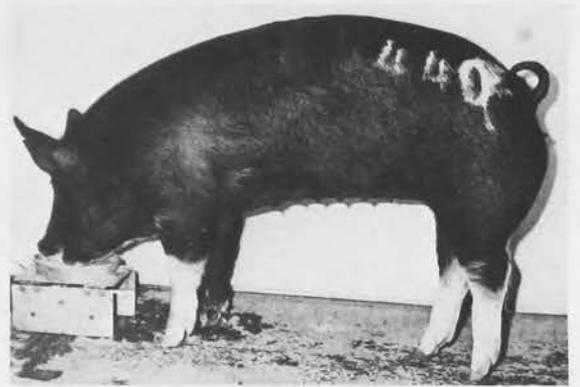
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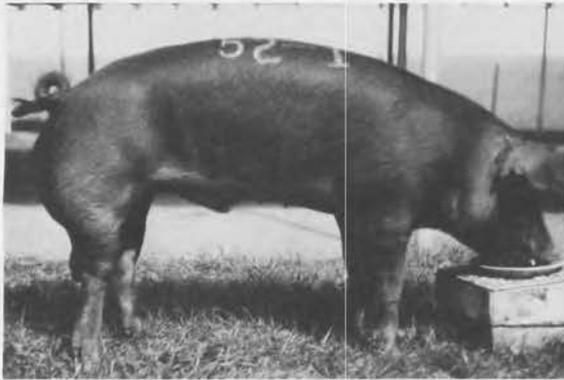
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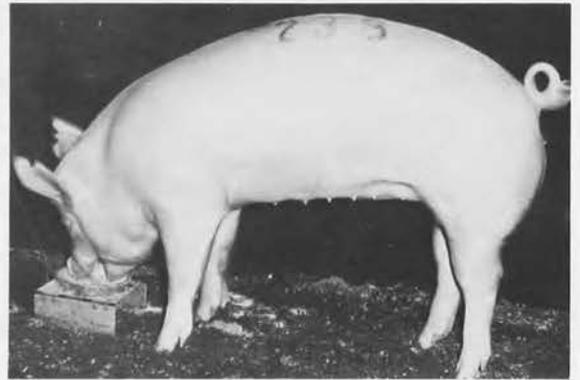
SPOTTED



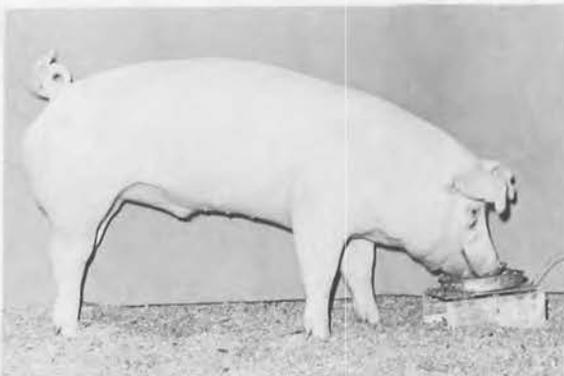
BERKSHIRE



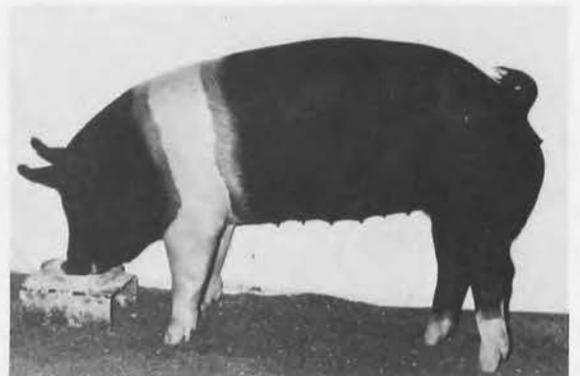
DUROC



YORKSHIRE



CHESTER WHITE



HAMPSHIRE

HERD BOAR SELECTION

Since most genetic improvement for growth, efficiency and carcass merit will come from herd boar selection, you must be very selective. Therefore, select a herd boar from those producers who have on-the-farm or central test data. These herds should have a strong herd health and vaccination program. Besides the guidelines listed in table 3, the boars should be genetically free from umbilical or scrotal hernias, free from Porcine Stress Syndrome (PSS), have sound reproductive organs, and have adequate sex drive.

If you plan to produce your own purebred boars, follow the same procedure outlined for gilt selection. The boars should be full fed to heavier weights which approach at least 240 pounds. This allows them to achieve their genetic growth potential. A purebred producer should maintain a more detailed record program, and be actively involved in the state or national breed performance programs. Central testing of samples of your breeding stock must be considered. These programs are more completely outlined in Extension Bulletin 349, Swine Improvement Through Swine Evaluation Stations.

MOST POPULAR BREEDS OF SWINE

A breed is a group of hogs which look alike, have similar color markings, and the same origin. To be registered with a breed association, an animal must meet certain color requirements, be free from swirls and other defects, and have recorded parents. These recorded pigs are called purebreds. Crossbred pigs are not registered.

Berkshire. The Berkshire was developed in England. They are black with six white points (four feet, nose, and tail). They have erect ears and an upturned nose. Berkshires produce long, acceptable carcasses.

Chester White. The Chester White breed originated in Pennsylvania. They are sometimes called "Chesters." They are solid white and have droopy ears. Chesters are noted for their mothering ability, litter size, and high percentage of ham.

Duroc. The Duroc breed originated from the Jersey Red hogs of New Jersey and Duroc hogs of New York and were once called Duroc Jerseys. Durocs vary from light to dark red in color and have droopy ears. Durocs have a superior growth rate, feed efficiency, and above average carcass leanness.

Hampshire. Hampshires originated in Kentucky. They are black with a white belt around the shoulders and body, including the front legs. They have erect ears. Hampshires excel in producing lean, muscular carcasses and have good growth.

Landrace. The Landrace breed originated in Denmark. They are white, long, and have large droopy ears. Landrace excels most breeds for litter size and mothering ability. They grow well and produce long, acceptable carcasses.

Poland China. The Poland China breed originated in southwestern Ohio and are sometimes called Polands. They are black with white on the feet, tip of the nose, and tip of the tail. Polands have droopy ears. They produce carcasses with low backfat thickness and large loin eye areas.

Spotted. The Spotted breed, or "Spots" as they are usually called, originated in Indiana. Spotted swine are black and white in color and have droopy ears. Spots grow rapidly and produce muscular carcasses.

Yorkshire. Yorkshire hogs were developed in northern England. They are known as "Large Whites" in that country. They are solid white and have erect ears. Yorkshires are noted for their large litters, mothering ability, rapid growth, efficiency of gain and body length.

SELECTING A BREED

When planning the swine program, select a breed or crossbred combination that you wish to raise. Remember, a pig's performance is the result of two things: (1) the traits the pig inherited from its parents, and (2) the environment, or the care the pig receives.

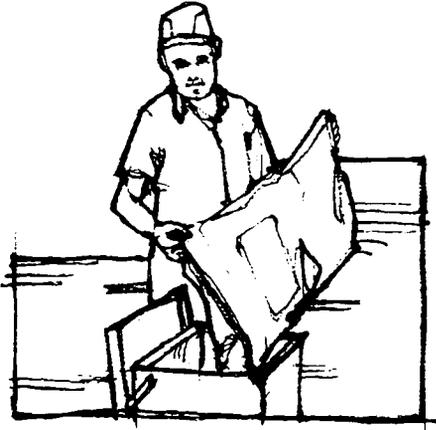
Often the dam (gilt or sow) has not been performance tested, and you must make your selection based on the sire's (boar's) performance. Remember that the record, alone, of the dam or sire is not enough to insure a quality animal. Select an animal which compares favorably to the ideal modern animal.

Breeds do differ in litter size, growth, feed efficiency, carcass length, leanness, and muscle. These breeds can be compared by evaluating the central testing station results. In tables 4, 5, and 6 (p 29), you can compare these differences over the past years. More detailed information as to breed evaluation and crossbreeding is presented in Extension Bulletin 371, Swine Improvement Through Crossbreeding.

BREED ASSOCIATIONS

Each swine breed has an official association which makes the rules and regulations for registering the purebred hogs of the breed. The purebred breeders who raise the particular breed make up the breed association membership and elect their own board of directors and officers.

Each association has a secretary who takes care of the registrations and transfers of hogs registered with the association. The breed secretary conducts the breed promotion program. If you are interested in a particular breed, you can get information about a breed and their programs by writing to the breed association (table 7, p 30).



pig feeding and caring

FEEDING YOUR PIGS

After you have selected your pigs, you will want to feed them a balanced ration. This ration should contain adequate nutrients (energy, protein, vitamins and minerals) to meet the animals' needs.

Energy nutrients are the carbohydrates, fats, and oils in the ration. A swine ration is composed mostly of carbohydrates. The energy nutrients are the body's fuel and are used for movements, such as walking and eating. They are also used to produce heat.

Proteins supply the material from which body tissue is made. The proteins that are eaten eventually become muscle, bone, blood, skin, hair, and hooves.

Several different vitamins are added to rations, and each vitamin has a different function. Vitamin A is responsible for the health of the eyes and the tissues of nasal passages and lungs. Vitamin D helps the proper development of bones. Vitamin E influences reproduction and muscle coordination; vitamin K coagulates blood. The B complex vitamins have many bodily functions: riboflavin influences the enzyme system; pantothenic acid affects coordination and growth; niacin promotes growth; and B₁₂ improves growth and reduces anemia.

Minerals, such as calcium and phosphorus, are needed only in small amounts in the ration, but they are very important in bone development and in the chemical reactions of the pig's body. Anemia, for instance, is a nutritional disease of baby pigs caused by a lack of iron in the sow's milk. A deficiency of zinc will cause parakeratosis which is a crusty appearing skin disorder. Pigs born without hair usually have an iodine deficiency.

These are just a few examples of why feeding a balanced ration is important. Feeding too little or too much of some of the nutrients can reduce swine performance. Feeding a balanced diet will maximize gain and provide overall pork production efficiency. Swine rations may be ground, mixed, and put in a self-feeder. A medium grind is best, since too fine a grind will make a dusty condition and cause feed wastage.

FORMULATING RATIONS

You need only three kinds of rations for all classes of hogs: (1) a creep ration (2) a 16 percent protein growing ration and (3) a 13 percent protein finishing ration. If you are buying your supplements from a commercial feed manufacturer, feed his creep ration to your pigs until they weigh 30 pounds. After this, formulate your own ration. Feed your pigs about a 16 percent protein ration until they weigh 100 pounds. A good ratio of corn to supplement is about three parts of corn to one part of protein supplement.

A simple way to figure how much corn and supplement to use is to use the Pearson square. Let's assume we want to make a 16 percent protein and a commercial supplement containing 40 percent protein.

Draw a square as shown in figure 1. In the center of the square, put the protein percent you want in the total ration. At the upper left-hand corner of the square, write "corn" and its protein content (8) (see table 8, p 30, for feed composition); at the lower left-hand corner, write "supplement" and its protein content (40).

Subtract diagonally across the square (the smaller number from the larger) and enter the results at the corners on the right-hand side ($16-8 = 8$; $40-16 = 24$).

The number at the upper right-hand corner gives the parts of corn, by weight, and the number in the lower right-hand corner gives the parts of supplement, by weight. In our example, the ratio of corn to supplement is 3:1.

Figure 1. Pearson square for formulating rations.

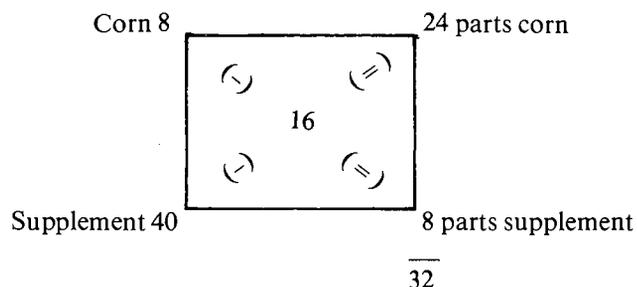


Figure 2. Determine the cost per unit of protein. Soybean meal helps provide the necessary amounts of amino acids to supplement cereal grains.

$$\frac{\text{Protein cost cwt.}}{\text{Protein \%}} = \text{Price per unit of protein}$$

Example: Soybean meal	vs.	Fish meal
Protein cost = \$140/ton	=	\$200/ton
= \$7/cwt.	=	\$10/cwt.
Protein % = 44	=	60

$$\frac{\$7.00}{44} = \$0.159 \quad \text{vs.} \quad \frac{\$10.00}{60} = \$0.166$$

FEEDING PROGRAM FOR GROWING PIGS

The feeding program for market pigs begins when they are old enough to eat, which is at about 15 to 20 days of age. Market pigs should be fed all they want to eat of the balanced ration. It is not good to limit their feed to make the weight limit for a show or to produce a leaner carcass, since it is not profitable or good swine management. An animal should be selected at the weight necessary to gain efficiently to meet market weight by show time or for peak market sale.

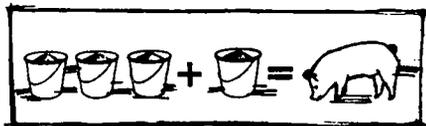
The protein, calcium, and phosphorus requirements of growing swine are shown in table 9 (p 31).

Meeting the protein requirements of pigs is a matter of supplying enough of the essential amino acids — the building blocks of protein. Soybean meal is unique as a plant protein in its capacity to provide the necessary amounts of amino acids to supplement cereal grains, like corn, when rations contain adequate protein. Other protein supplemental feeds work well in combination with soybean meal and can be used when the price per unit of protein does not exceed that of 1 pound of protein from soybean meal (figure 2).

The ration example (table 10, p 31) illustrates a variety of diets containing different percentages of protein and how other protein supplemental feeds can be used in combination with soybean meal.

Various mineral sources of calcium and phosphorus can be substituted in each ration. A rule of thumb is 6 pounds of steamed bone meal are equal to 5 pounds of dicalcium phosphate and 2 pounds of ground feeding type limestone.

The addition of effective antibiotics has been found to increase daily gains approximately 10 percent; in some instances, it has resulted in slight reductions in feed required per unit of gain. Add antibiotics at the rate of 10 to 20 grams per ton of finished feed until the pigs weigh 125 pounds. Antibiotic additions have not consistently increased gains of pigs weighing over 125 pounds; if added, this should not be given at a rate of more than 10 grams per ton of complete feed.



FEEDING SOWS AND GILTS

When the breeding gilts reach 150-175 pounds, separate them from the other pigs. Once replacement gilts have been separated from the market herd, a nutritionally adequate 14-16 percent protein diet should be fed at a rate of 4-5 pounds per head daily until they are about 8 months old (table 11, p 31). Use of feeding stalls will assure a uniform feed intake for the sow during this period.

An increase in the energy intake of gilts shortly before breeding (10-14 days) is known as flushing. Self-feeding or hand feeding an additional 2 pounds per head daily of ration 1 (table 11) will increase the number of ova shed during estrus (heat) and increase litter size.

Although the examples use corn as the primary source of energy, ground barley or milo can be substituted for corn and fed at the same rate of 4 pounds of ration per day. Since ration 3 has more bulk due to the additional oats, feed this ration at 5 pounds per day if barley is used to replace corn.

As soon as the sows are pregnant, additional nutrients must be added to the ration. In confinement, hand feed 4 pounds of a complete 14 to 15 percent protein ration per sow per day during the summer months (table 13, p 32). During the winter months, this allotment should be increased to 5 pounds daily. Since two-thirds of the fetal pig's growth is during the last third of the gestation period, increasing the level of feed to 5 pounds per day should maximize pig size and still keep sow weight gains at a minimum. If good alfalfa or ladino clover pasture is available, suggested feeding levels can be reduced by one half. Additional information is available in Animal Science Fact Sheets 13, 14 and 15 which relate to nutrition, breeding and management of the sow.

Because silage is bulky, it can be fed to bred sows. Sows fed 10 to 14 pounds will appear satisfied and will not act hungry. Add 1.5 pounds protein supplement for gilts and 0.5 to 1.0 pounds of ground corn for sows in poor condition. Additional information is available in Animal Science Fact Sheet 31, Feeding Silage to Bred Sows and Gilts.

The sows' feed intake capacity is sometimes underestimated, and excessive weight gains often occur, even when the ration contains large quantities of bulky feeds. Gestation weight gain for gilts bred at about 250 pounds need not exceed 70-80 pounds. It is not necessary for sows to gain more than 50-60 pounds during this period — the greater the gain during gestation, the greater the weight loss during lactation.

Various feed additives may be added to the gestation ration if there is a herd health problem. The addition of drugs like sulfa and methazone tend to reduce atrophic rhinitis in the baby pig. Feeding Dichlorvos (atgard c) during the gestation period reduces stillbirth which improves litter size and litter weaning weight. Although using drugs may achieve a desired response, always balance the cost of the product to be used against that response.

An important management practice just before and during farrowing is to provide adequate fresh water and reduce the quantity of feed. Feed only 2 to 3 pounds of feed for the 5 days before the sow farrows. Do not feed on the day she farrows, but make sure she drinks water. On the day after farrowing, feed about 4 pounds (table 14, p 33). Gradually increase this quantity each day until she is on full feed in 5 to 6 days.

Bulk, such as wheat bran or oats, may replace 10 to 20 percent of the corn in the farrowing ration. By increasing the bulk, you will reduce farrowing and early lactation problems, such as constipation and reduced milk flow. Linseed meal may be added to the ration to improve a condition of constipation in sows that are in close confinement and have limited exercise.

During lactation, either self-feed or hand feed an amount the sow will clean up in about 30 minutes twice a day (table 14).

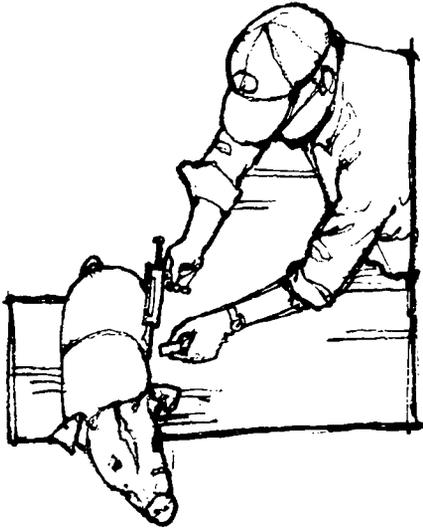
FEEDING BOARS

Proper feeding of the boar for maximum growth, structure, and reproductive development is basic breeding management. Young boars should be fed a 16 percent protein growing ration (table 10, p 31) up to a 220 to 240 pound weight. The right type of boar should not get too fat. The amount of feed fed should keep him in good growing condition. Feed him 4 to 5 pounds of the same rations given to the sows during their gestation. During breeding, increase the feed to about 6 pounds daily,

depending on his bodily condition. Under extremely cold weather conditions, increase the feed intake by 1 to 2 pounds to provide additional energy to keep him warm.

WATER

Clean, fresh water should be provided continuously to swine of all ages. The cheapest, yet the most important ingredient for hogs is water. Hogs will consume about 2 pounds of water for every 1 pound of feed eaten (table 15, p 33). Blood contains 90 to 95 percent water. Since sow's milk contains more than 80 percent water, a lactating nursing sow will consume about 4 pounds of water for every pound of feed. This shows the importance of water for both growing swine and lactating sows.



keeping your swine healthy

PARASITE CONTROL

Worming

Since your pigs could be infected with parasitic eggs, worm your pigs soon after you start them on feed. Use a commercial wormer, such as Dichlorvos, Piperazine, or Tramisol, at the manufacturer's recommendations.

Dichlorvos will kill three major intestinal worms in swine, namely, large roundworms, whip worms, and nodular worms. Tramisol kills the large roundworm, nodular worms, and lung worms. Piperazine controls roundworms and nodular worms. Another product which can be purchased is called Banmuth, which can be fed in the feed and effectively controls most worms.

Because the worm cycle is such that the larva develops and reinfects the pigs, you may need to worm your pigs again in about 4 weeks. There may be an advantage in using a different wormer for the second treatment for control of additional types of worms (table 16, p 33). Sows and boars should be wormed prior to breeding. The sow should be free of worms at farrowing. She should be thoroughly washed to rid her of any worm eggs which will infect her newborn pigs.

Lice and mange control

The louse is a blood-sucking parasite that causes irritation and may cost you more losses than all the internal parasites combined. Spray your pigs for hog lice and mange mites after you start them on feed. This should not be done within 10 days of weaning or when pigs are under stress. To eradicate mange from the sow herd, give six weekly sprayings. Four weekly sprayings will control mange and kill lice. Be sure to thoroughly saturate the pig at the base of the ear and ham areas. Use a mixture of 2½ tablespoons of a 55 percent malathion emulsion concentrate per gallon of water. **CAUTION:** Read all insecticide labels carefully and follow manufacturer's recommendations and precautions. For other materials, refer to Extension Folder 208, Swine Parasites.

A good sanitation program will always reduce parasite problems. Raise your pigs in an area that is free of worms and filth. These conditions can be provided by providing clean pasture or feeding them on concrete or slatted floors. Do not allow your pigs in fields where they can get into farm ponds, mud holes, or other wet, filthy areas.

Swine diseases

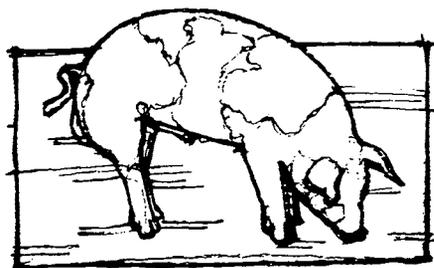
There are several swine diseases that attack pigs. Erysipelas, rhinitis, and virus pig pneumonia are the three most significant ones. Baby pigs from birth to weaning are prime targets for various forms of scours. Breeding stock are most seriously infected by various reproductive diseases which may cause infertility, abortion or small, weak litters. Most of these diseases can be reduced by superior management and care. As a producer, you must be aware of the symptoms, prevention and treatment available once your pigs have contracted the disease.

SWINE DISEASE CHART

Disease	Symptoms	Prevention	Treatment	Drug Withdrawal Before Slaughter
Young pig diseases				
Anemia	Weak pigs, light dull skin, rough hair, thumps, death.	Good pig management; balanced diet with adequate vitamin K and iron; no moldy feed; prevent ulcers by reduced stress; select stress resistant.	Add copper, iron, vitamin K to sow diet; inject iron.	none
Arthritis, PPLO, Lameness	Swelling of hock, stifle and elbow joints. Hip, foot and shoulder infected but difficult to observe. Stiff pigs, reluctant to move.	Clip needle teeth, ear notch and dock sanitarly with disinfectant; abrasion of feet and knee; avoid rough floors; disinfect navels; avoid pen cuts due to nails, wires and sharp objects.	Injectable antibiotics: Oxytetracycline Penicillin Tylosin	18 days 5 days 4 days
Edema disease	Enterotoxemia, excessive body fluid, wobbly walk, swelling around face, ears and stomach.	Avoid stresses, use feeds with high fiber content during stress periods like weaning, shipment, feed changes.	Remove feed for 24 hours. Add nitrofurazone or sulfa drugs to water	none 10 days
Erysipelas	Vomiting, diarrhea, pigs listless, off feed, show stiff gait, high arched back, develop diamond shaped purple skin spots.	Vaccinate with erysipelas vaccine 6-8 weeks of age. Vaccinate gilts and sows 90 days before farrowing.	Anti-swine erysipelas serum. Penicillin	5 days
Greasy pig disease	Greasy, extremely oily, crusty skin appearance.	Caused by staphylococcal organism.	Penicillin Dip pig into antiseptic solution of tamed iodine (Betadine) or chlorohexadine.	5 days
Hemorrhagic syndrome	Called bleeding disease. Excessive bleeding.	Unknown factors cause disease. Anti-vitamin K factor. Add menadione sodium bisulfate at 2 gm/ton of feed.	Increase level of menadione sodium bisulfate in feed and water.	none
Jowl abscess	Enlargement and swelling of jowl and jaw area.	Vaccinate at 10-15 weeks of age. Add chlortetracycline, 100 gm/ton.	Surgical removal. Do sensitivity test and treat with antibiotics, inject penicillin.	5 days
Parakeratosis	Rough, scaly skin along flank and feet.	Zinc deficiency, high calcium with improperly balanced rations.	100-150 ppm of zinc added to ration or drinking water.	none
Pneumonia Bacteria Pasteurella	Sneezing, coughs, fever, feed refusal, body thumps.	Avoid drafts, wet, cold floors, chilling; exposure to sick pigs. Improve management.	Inject intermuscular: Oxytetracycline Penicillin Tylosin Feed sulfamethazine tetracycline.	18 days 5 days 4 days 7 days
Rhinitis	Sneezing, sniffing, bloody discharge from nose; shortened bulldog shaped nose, turned snout in severe cases.	Caused by bacteria or bordtella bronchiseptica. Treat and check breeding stock by nasal swab technique. Avoid and cull carrier stock. Keep cats and rats from farrowing house.	Add sulfamethazine in creep feed to 75 pound weight. Add sulfathiazole and broad spectrum of antibiotics to market. Add sulfamethazine to lactation rations.	7 days
Scours: Bloody-vibronic	Bloody and mucus diarrhea, dehydration, weight loss. Affects all ages, all seasons, spreads rapidly to other pigs, causes stunted growth.	Use sensitivity test to diagnose type of scours. Isolate new pigs, avoid contamination from trucks, equipment, visitors; control disease by depopulation, complete clean-up, and restock with clean animals.	Add arsanilic acid to feed or water. Add furazolidone, 30 gm/ton of feed for 14 days. Add neomycin sulfate, 70-140 gm/ton.	5 days none none

Disease	Symptoms	Prevention	Treatment	Drug Withdrawal Before Slaughter
Scours cont'd.:				
Clostridial	Affects pigs 1st week after birth, usually in 36 hours. Yellow, watery diarrhea, heavily blood stained. Some vomiting.	Limit people, animals to facility. Avoid exposure. Inject sow with two toxoid vaccinations 6 weeks and 2 weeks prior to farrowing.	None, except pig antiserum.	
MMA	Starvation due to inadequate milk from sow. Milk causes pigs to scour and die. Sow off feed, swollen sow udder.	Vaccinate sow with mixed bacterins. Early detection, reduce feed prior to farrowing; adequate laxative ration.	Place pigs on milk replacer.	
Salmonellosis	Called necro. Watery, yellow diarrhea with blood. Temperature subnormal or as high as 107 degrees.	Avoid contamination of feed by carrier animals like rodents, birds, and other pigs.	Feed bacitracin, 100 gm/ton. Feed chlortetracycline, 100 gm/ton. Feed neomycin sulfate, 140 gm/ton. Water sulfathiazole	none none none 10 days
T.G.E.	1 to 8-day-old pigs have watery diarrhea, high death rate, spreads rapidly, highest occurrence during winter. Vomiting occurs in pigs and sows.	Avoid exposure. Vaccinate sows twice — 6 weeks and 2 weeks prior to farrowing.	None. Avoid exposure.	
White (E. coli, colibacillosis)	1st 4 days of life — watery, yellow diarrhea; 3 week old and weanling — sudden death, sudden scouring, no vomiting occurs. Variable mortality, slow spreading.	Medicate feed or water 5-7 days during stress period. Avoid stresses and contamination. Keep temperature at 90 degrees F with no fluctuations. Expose pregnant sows to newly weaned sows 3-4 weeks prior to farrowing.	Use injectable iron and copper. Treat like salmonellosis scours.	
Shaky pig disease	Muscle tremors, unable to stand up.	Various causes. Vaccine virus, like influenza or hog cholera virus. Viral diseases, such as influenza, in sow. Genetic recessive.	Diagnose if genetical or microbiological. If genetical, cull affected line.	
Breeding herd				
Brucellosis	Abortion. Pig born weak. Sow and gilts infertile. Abort 15 days after breeding, boars sterile and testicles swollen; discharge from sheath.	Boar is main spreader of disease. Avoid trucks and vehicles which may carry disease. Carriers like rodents, dogs, cats spread aborted material. Blood test; market infected animals. Develop brucellosis free herd program.	None	
Leptospirosis	Brood sow aborts 2-4 weeks before farrowing. In mild cases, pigs run high fever, lose weight, go off feed. Stillbirths occur at farrowing.	Caused by feed and water contamination from other animal's urine. Organism is shed in urine up to 6 months or more. Vaccinate with leptospirosis bacterin at breeding time.	Oxytetracycline Streptomycin Chlortetracycline 200 gm/ton continuous 400 gm/ton for 14 days (Treatment doesn't prevent spread of disease.)	18 days 30 days none
M.M.A. Mastitis Metritis Agalactia	Combination of hard udders, failure to milk, bad smelly vaginal discharge. Milk causes pigs to scour and die.	Feed antibiotics which sensitivity testing indicates, vaccinate sows with mixed bacterins, use 6 weeks before farrowing (2 injections). Use good management prior to farrowing. Avoid stress in sows. Avoid high heat temperature on sow's udder. Maintain temperature at 70 degrees F.	Oxytetracycline Streptomycin Tylosin Cortico-steroids	18 days 30 days 4 days

Disease	Symptoms	Prevention	Treatment	Drug Withdrawal Before Slaughter
Pseudorabies	Body temperature elevates to 105 degrees in pigs, vomiting, diarrhea, depression, trembling, incoordination, finally death. Older pigs cough and constipation occurs. Pregnant sows: 50 percent will abort, others will farrow. Baby pigs will be macerated, mummified and some normal.	Maintain closed herd. Allow only pseudorabies negative into herd. Isolate all animals for 30 days. Place with some market animals; observe for fever, reduced feed consumption.	None	
SEMDI	Stillborn, mummification, embryonic death, and infertility. Sows have small litters, repeat breeding increases, sows thought to be bred, return to heat, never farrow. Females farrow 1 or more dead pigs. Disease may recur in a 2-3 year cycle on some farms.	Maintain closed herd. Expose new stock, like boars, to breeding herd 30 days before breeding, through the fence exposure. Exchange manure from new stock to herd. This process builds immunity in herd.	None	



boar management

Once you have established foundation stock, introduce a boar into your breeding herd. This will be a primary source of possible disease exposure. Therefore, select a meaty-type performance-tested boar from a disease-free herd. Although brucellosis is a minor problem, buy boars from breeders who have validated clean herds. Blood test for leptospirosis and purchase boars which have been vaccinated for leptospirosis. Because pseudorabies is becoming more prevalent, select boars from herds with no history of the disease or test newly purchased boars. Select boars from stress resistant lines or test for Porcine Stress Syndrome (PSS).

Buy your boars at least 1 month before usage to allow him time to adjust to farm surroundings. By purchasing your boar early, you probably will have a better selection of boars available from breeders.

To control lice and mange, spray 4 consecutive weeks before the breeding season. Worm boars 10 days before the breeding period (table 16, p 33).

To maintain best fertility, provide protection for boars from high temperatures, both in transporting and during breeding. Consider the use of a shade and sprinkler system. Provide an exercise area to keep the boar in good physical condition before breeding.

You may pen boars of the same age or size together during off-breeding season; however, boars of different ages, such as junior and mature boars, should not run together. Although boars may be physically large and willing to service sows at 6 months of age, boars less than 7 months of age should be handled carefully and allowed limited service. Boars should be sexually mature before they are used in the breeding herd. Breeding too many sows to a boar may cause small litter size or low conception; therefore, use the guide (table 17, p 34) to determine the number of sows that may be served by one boar.

A minimum of 3 weeks is required for the boar to produce adequate normal sperm after a high temperature illness, so don't use a sick boar.

Rotation of boars improves litter size; therefore, use one boar for 12 hours and another the next 12 hours. Two services per heat period will result in about 1 to 2 more pigs per litter.

HANDLING THE NEWLY PURCHASED BOAR

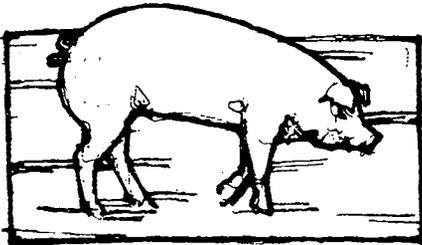
Proper care of the new boar the 1st month after he is on your farm can improve his chances of being a useful, aggressive breeder. Isolate him from the rest of the herd for the first 2 to 3 weeks. Following this period, expose the boar through fence contact to the female herd for about 30 days before breeding. This procedure will expose your boar and sow herd to the disease causing organisms which each may have acquired and will allow time to develop antibodies against them.

Allow the boar time to become acquainted with his new surroundings and to overcome any shyness before he is used.

When possible, have a fertility and reproductive tract check made by your veterinarian. To prepare for breeding, hand mate the young boar to a few market gilts or cull sows to see if he will work.

Handle the boar with care, and do not injure his sex organs. Avoid abusive handling or putting rings in his nose just before breeding. Such practices can reduce a boar's aggressiveness and interfere with his normal sexual behavioral patterns.

If your boars are acquainted with each other, you may allow them to run together with a group of gilts. This practice encourages more aggressiveness on the part of each boar. Don't, however, take young boars and dump them into a lot full of older sows. The older boss sows may fight the young, strange boar and make him a timid breeder.



gilt and sow management

BEFORE BREEDING

Gilts selected for the breeding herd should be separated from the market herd at 4 to 5 months of age or at 150 to 175 pounds. If they are not removed and limited in their feed, they may become too fat; besides, separating them can reduce your feed costs.

Sows and gilts should be blood tested for leptospirosis and be in good health. Although brucellosis has decreased in its incidence in the state, either blood test or select the gilts from validated clean herds.

Before breeding, spray females with malathion to control mange and lice. Gilts should be at least 8 months old and weigh 250 pounds or more before they are bred. Your gilts should have passed their third heat cycle before breeding. This procedure will increase litter size.

If you are weaning your pigs under 3 weeks of age, breed your sows on the second heat period after weaning. Breed on the first heat period if weaning is after 3 weeks of age.

The feed intake should be increased 10 to 14 days before breeding starts and be maintained until each gilt or sow is bred. This procedure is called flushing, and generally increases ovulation and litter size. Don't continue to feed at a high level after breeding, since it will increase embryonic mortality and reduce litter size.

BREEDING AND GESTATION

To increase litter size, breed sows or gilts twice, one day apart. Breed once at the onset of heat and once just before each sow goes out of heat. Record breeding dates.

Since you may have some dominating sows, gilts and sows should be separated during the gestation period. Do not permit sows to get too fat, but feed about 4 pounds of a 15 percent protein ration for each sow. Refer to breeding dates to prepare for farrowing, and introduce her to the farrowing quarters a week before she farrows (table 18, p 34).

BEFORE FARROWING

If your herd has had a problem with stillbirths, a treatment of Dichlorvos (atgard c) may improve the number of live births. It will also worm your sows before farrowing. If your herd has not been exposed to the transmissible gastro enteritis (TGE) organism, you may wish to vaccinate both 4 and 2 weeks before farrowing.

Clean and disinfect pens, stalls, buildings, and equipment before farrowing. If possible, allow the stalls to be vacant for 3 weeks between farrowing seasons. If you continually farrow, a thorough sanitation is essential.

Wash each sow and gilt thoroughly with soap and warm water before placing her into a clean pen. This will eliminate many organisms and external parasites which are on the sow and will prevent baby pigs from becoming infected with disease producing bacteria and worm eggs when they first nurse. Bring your gilt or sow into quarters 2 to 5 days before farrowing so she will be accustomed to her surroundings.

Reduce feed and add wheat bran, linseed meal or other laxative feed just before farrowing to help prevent constipation and reduce diseases such as mastitis and metritis.

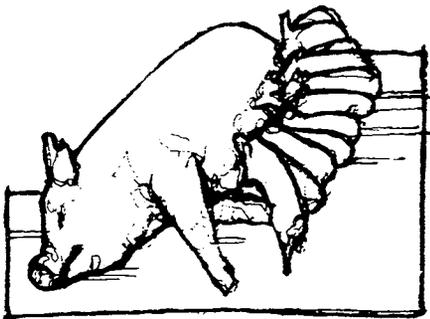
FARROWING

Management is critical and more important at farrowing than any other time. Since about 30 percent of the pigs which die after farrowing are caused by crushing, use farrowing stalls or guard rails during farrowing.

Do not feed the day of farrowing, but gradually build back up to full feed after farrowing. A feeding rule of thumb is to supply 3 pounds of feed plus 1 pound for each nursing pig. Since a sow needs 5 to 6 gallons of water per day to milk properly, supply plenty of clean, fresh water (table 15, p 33).

If bedding is used in the stalls, bed lightly with clean dry litter to help prevent baby pigs from burrowing under the bedding and getting crushed. If complete slatted floors are used in farrowing, use plywood, rubber or carpet mats and cover the slats for the first week after farrowing. This prevents chilling and possible pig scours. It helps prevent abrasion of the pigs' feet and knees.

Since the baby pigs cannot regulate their own body temperature until they are 3 days old, provide down at the pig level a temperature of 90 degrees F for first 10 days then gradually reduce to 80 degrees F until weaning in the farrowing quarters. Pigs are subject to chilling and colds; therefore, the pigs' surroundings must be dry, well ventilated and warm. Be present and make quiet, frequent observations.



baby pig management

As pigs arrive, dry them off and be sure they are breathing. As soon after birth as possible, disinfect the navel cord with tincture of iodine. This prevents the introduction of infectious organisms like those which cause arthritis. If pigs are bleeding excessively, tie off and clip the navel cord 1 1/2 to 2 inches in length. This bleeding condition could be caused by inadequate vitamin K in the sow ration.

Remove and place pigs in a basket if the sow farrows over a long period. Later, place all pigs on the sow to nurse so all pigs will get the sow's first milk, "colostrum." This colostrum contains considerable antibodies which help prevent the pigs from acquiring various diseases.

Clip needle teeth within 24 hours after farrowing. This will help to prevent the cutting of the sow's udder and other pigs in the litter. Such cuts are ready sources for possible infection and arthritis organism exposure. Tail biting is another confinement problem. Cutting the tail the first 24 hours after birth is a good practice. Leave about a 1 inch tail and disinfect with iodine. At the same time ear notch each pig for identification.

Some good management practices include supplementing the building heat source with heat lamps or radiant heaters in cooler weather. Place these lamps 12 inches out from the sow's udder and a minimum of 24 inches above the floor. Lamps positioned closer to the sow or pigs may cause heat lamp burn and possible udder problems.

Keep the house well-ventilated and dry; however, do not allow a draft or your pigs may become chilled. Watch your sows and pigs closely for sickness.

Sows which fail to eat, have abnormal temperatures, fail to milk, have abnormal discharge, or are sluggish should be treated. If a large number of dead or weak pigs are born, immediately notify your veterinarian. These conditions could be caused by diseases like leptospirosis, SMEDI, or pseudorabies.

Record farrowing information on litter records for use in selection of replacement gilts.

FIRST WEEK AFTER FARROWING

Since the first week of life is critical for the newborn pig, be aware of pig scours. The sow should milk well and want to care for her pigs. The sow's milk is low in iron; therefore, pigs will become anemic. Give a 150-200 milligram iron dextran shot



into the neck region at 4 days of age. The area around the neck or under the foreleg is preferred to the ham area. Ham iron injections often cause yellow stained hams at slaughter.

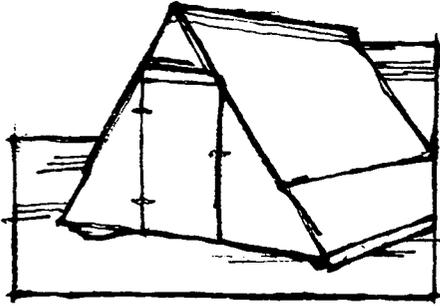
If you are going to market your male pigs as barrows, castrate them at 2 to 3 weeks of age. They are easier to handle and will be healed prior to weaning.

THREE TO EIGHT WEEKS AFTER FARROWING

Most producers wean their pigs at 5 weeks of age; consider weaning between 3 to 8 weeks, depending on your overall production program. Before weaning, you must vaccinate for erysipelas. Schedule a time with your veterinarian. Also before weaning, expose your pigs to a creep feed so they will be used to eating. Provide an 18-20 percent protein which contains adequate vitamins and minerals. Include antibiotics like auero SP250 for prevention against scours and rhinitis and carbadox for bloody scour prevention.

The fourth week of the pig's life is critical. Small pigs get their immunity to the farm diseases from the sow or gilt in the form of antibodies through the sow's colostrum. The pig cannot produce its own antibodies in adequate quantity until the fifth or sixth week of age; therefore, do not stress pigs, such as weaning, castrating, changing temperature or feed, etc., when they are 4 weeks old. Do not vaccinate, worm, and castrate all at the same time. For more detailed information refer to Extension Bulletin 370, Feeding and Management of Baby Pigs.

swine housing and equipment



The amount of housing and equipment needed is dependent on the size of your operation, capital available, labor source and land value. If pasture is available and you plan to have limited investment in buildings, construction of an "A" type house (figure 3), or a portable house (figure 4) is the most practical. Portable houses which are open to one side can be used for farrowing or protection during the summer. Two units can be combined for greater protection during the cool or winter seasons.

Sun shade can be economically erected for a pasture program. Either permanent pole type shade (figure 5) or a portable unit (figure 6) can be used for summer protection. During the cold seasons, wood can be placed on three sides to give protection. A ridge opening should be left on the side opposite the open front to allow for proper ventilation.

Figure 3. "A" type house adaptable for sow-litter system.

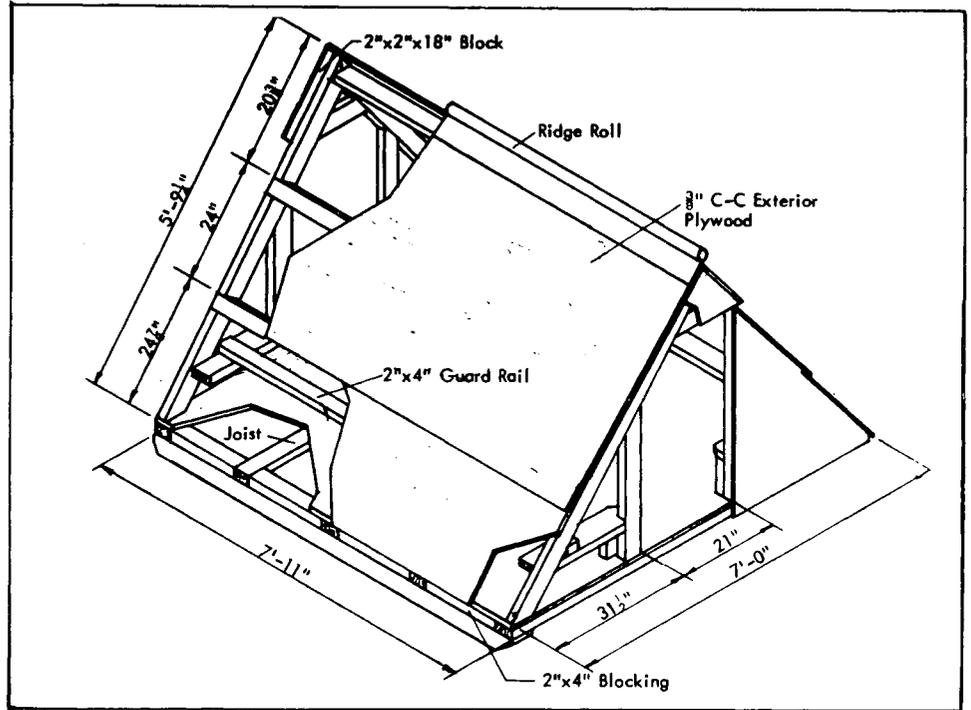
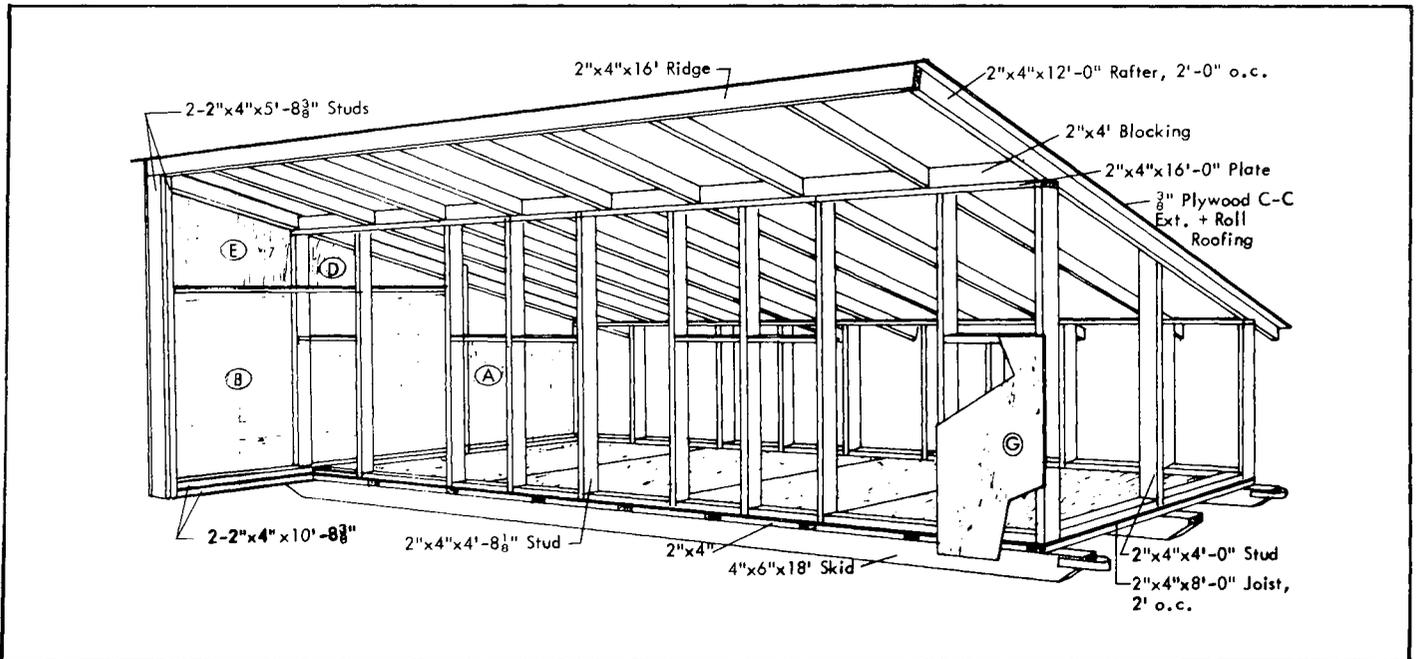


Figure 4. Portable three-sow house which can be combined with another unit to make a six-sow unit for enclosed farrowing system.



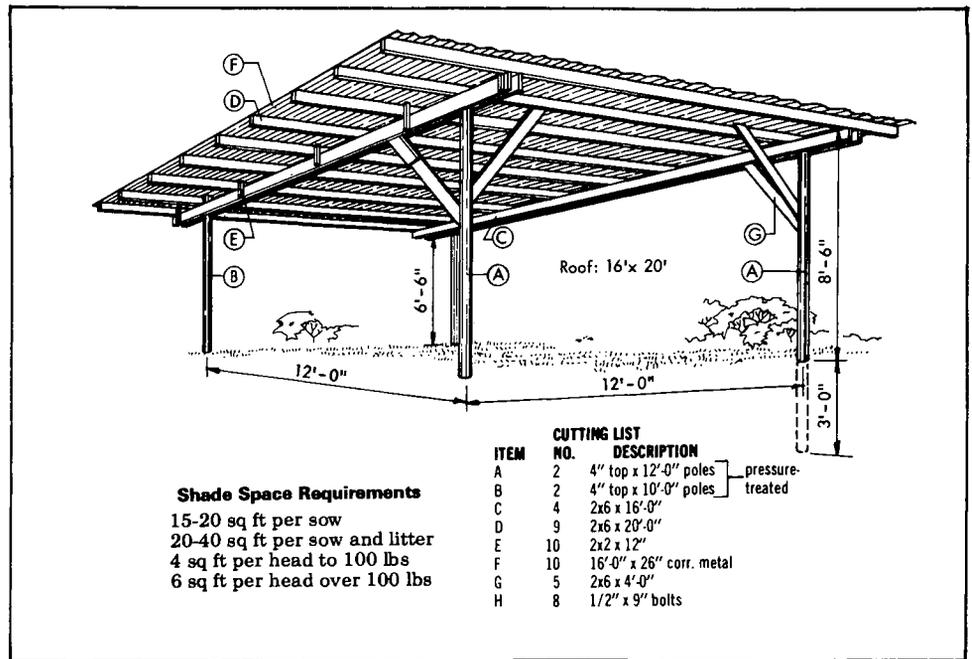


Figure 5. Permanent pole type shelter for summer protection. Sides can be attached for cool season protection.

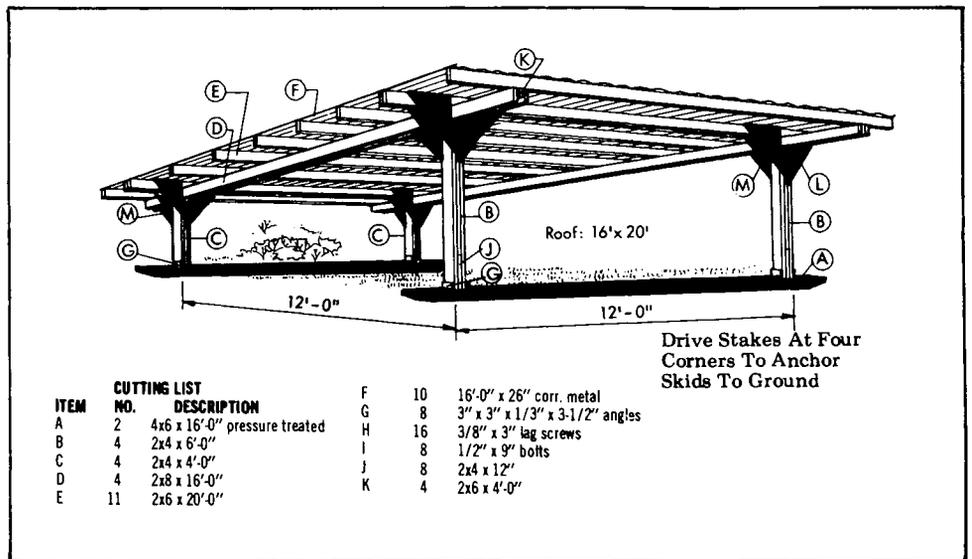


Figure 6. Portable summer shade is useful for summer feeding. Sides can be attached for cool season protection.

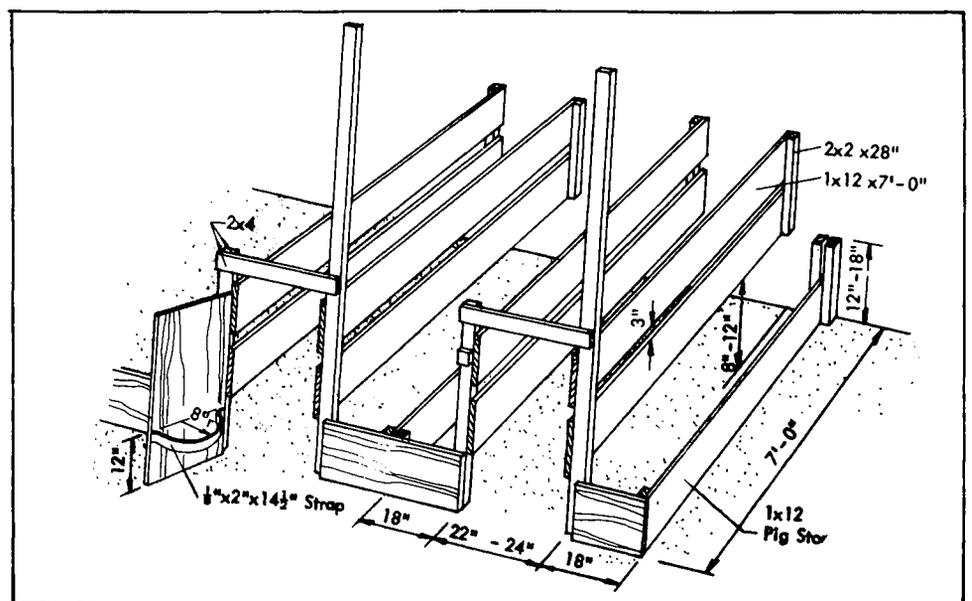


Figure 7. Wooden constructed farrowing stall can be built to fit portable or permanent swine house.

Farrowing stalls should be constructed in the portable houses or in an enclosed farrowing house. The stalls will prevent overlaying of pigs after farrowing and will increase the number of pigs weaned. Either wooden or metal type construction is available. One can buy various kinds of farrowing stalls which restrain the sow. Areas on each side of the sow are provided for the pigs. Wooden stalls (figure 7) can be built. Although steel crates have more longevity they are more expensive. Other types of stalls or pens which allow more movement for the sow (figure 8) can be built. Guard rails must be provided along each side of the pen to prevent the sow from laying against the side of the pen and overlaying her pigs. Additional plans are available through "Midwest Swine Handbook Housing and Equipment" (MWPS-8).

Figure 8. Farrowing-growing pen used for farrowing and nursery after weaning.

The farrowing-growing pens can be used as a nursery for the pigs after weaning. The sow should be removed from the quarters and the pigs left in each of their respective pens. Once the pigs approach 40 pounds they can be moved to a finishing barn.

Figure 9. Concrete trough made from a concrete form.

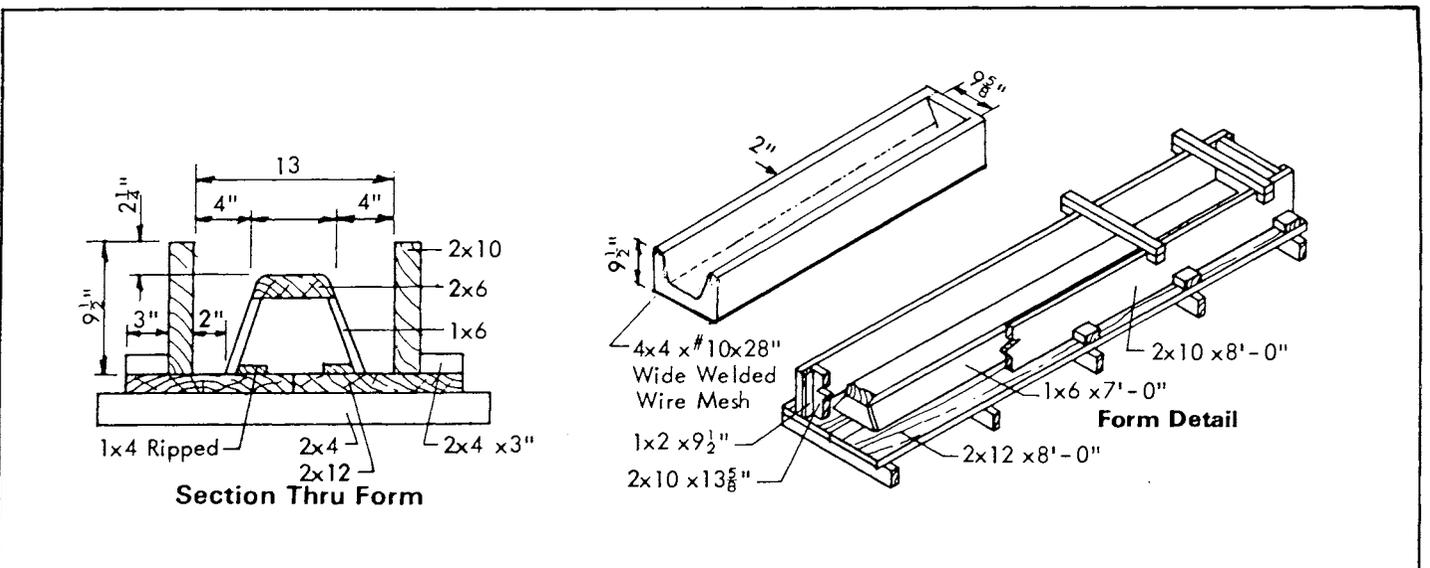
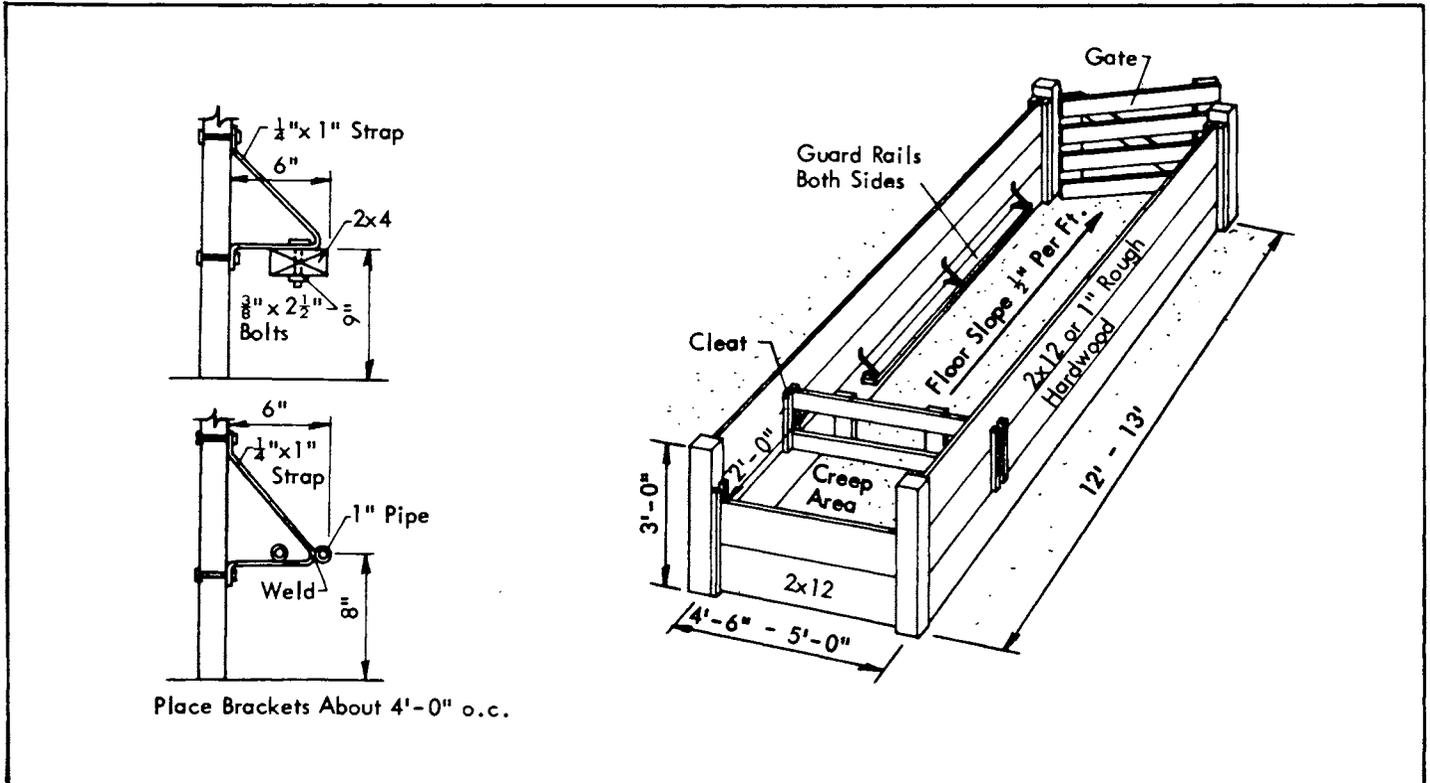


Figure 10. Locate along building wall for confined finished, or along drive or fenceline. Provide roof for outdoor use.

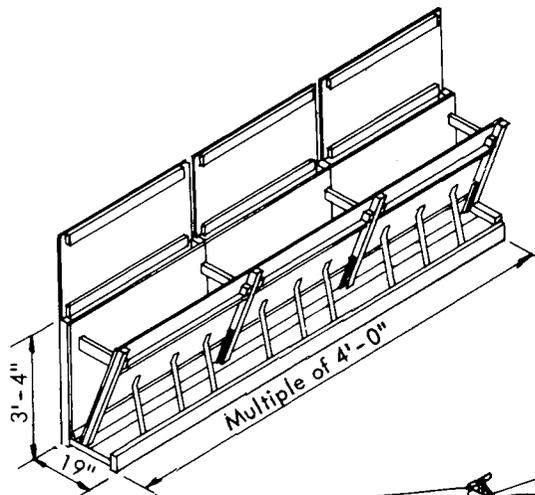
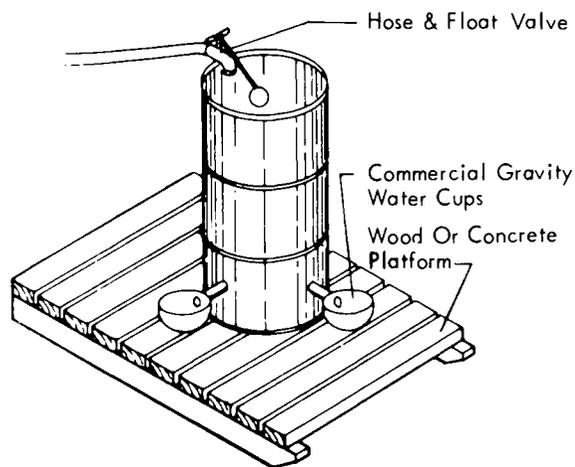


Figure 11. A portable waterer made from 50 gallon barrel and watering cups. A hose and float valve can be attached for convenience. A platform prevents water mud holes.



Additional savings can be made in feeders and equipment with this system, since the sows could be left out of their individual stalls and fed in a common area. The sows will have more exercise and less pen cleaning is needed.

Various wooden or metal feeders can be purchased commercially. Compare various dealer prices to the cost of building your own equipment. For hand feeding small groups of pigs, either concrete or wooden troughs can be constructed. A simple wooden trough can be constructed by cutting the desired 2 inch X 10 inch base and nailing 2 inch X 6 inch side pieces to each side. A concrete form (figure 9) can be made to construct a number of concrete troughs.

Larger finishing self-feeders can be built for either indoor or outdoor use by simply adding a hinged roof (figure 10). The feeder can be made in 4 foot sections where each section has an 8 bushel feed capacity. These feeders can be placed along a fence line, drive, or a building wall.

An adequate, clean source of water is essential. You can buy watering cups or nipple waterers. These watering devices can be purchased from most farm equipment suppliers. These waterers can be attached to sturdy posts or walls. A plastic hose can be attached to each waterer.

A portable waterer can be built out of a 50 gallon barrel with attached watering cups (figure 11). A wooden platform adds to the movement of the waterer and prevents pigs routing a hole from water spillage.

Some additional equipment which you will find useful is a trailer and loading chute. A loading chute can be made out of two pieces of 3/4 inch outdoor type "C" plywood for the side pieces. Three 2 inch X 8 inch boards nailed together with 2 inch X 2 inch cleats can be used as a floor. Three 2 inch X 4 inch uprights can be nailed on each side for the appropriate slope to your pickup. Skids made of 4 inch X 4 inch pieces can be nailed to the base to make the chute portable. If larger trucks will be used for transportation, the chute length should be increased to 12 feet. The interior width of the chute should not exceed 24 inches.

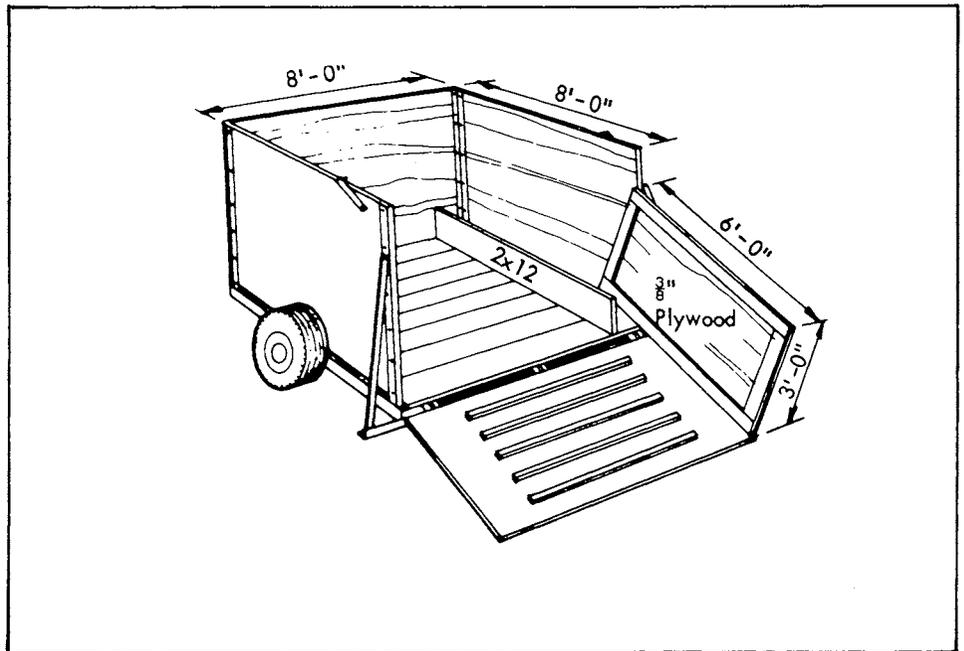


Figure 12. Two-wheeled trailer used to transport weanling pigs to feeding unit or to pasture. Trailer could be used as a loading chute.

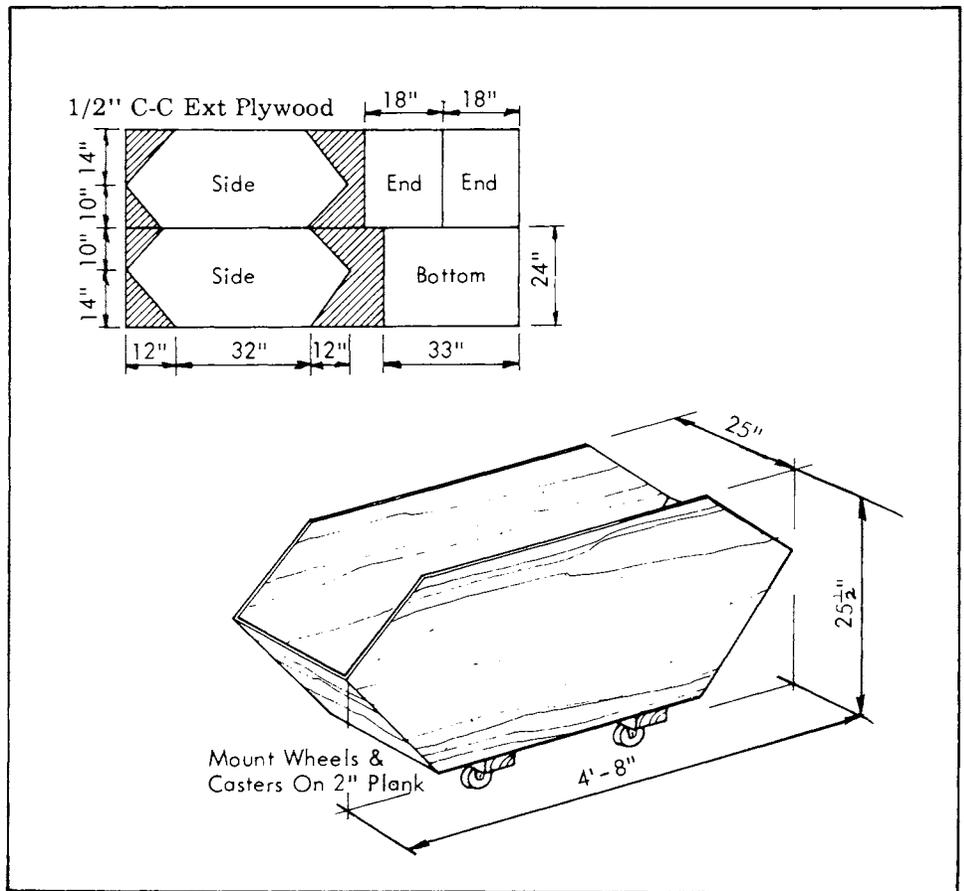


Figure 13. Feed cart made from plywood useful in farrowing house and nursery barn.

A trailer is a very handy piece of equipment for moving pigs. A simply designed trailer (figure 12) can be built. The end gate can be lowered for pig loading. If the wheel base is high enough, the trailer could be used as a loading chute by simply removing the front panel and placing it inside the trailer to guide the pigs into a narrow corridor into the truck.

A feed cart (figure 13) can be made from one piece of 3/4 inch exterior type plywood. This cart is useful in the farrowing house as well as in the nursery barn. The cart can be placed under a feed chute for mixing the appropriate feed ingredients. This cart will hold up to 10 bushels of feed.



fitting and showing



The primary purpose in fitting and showing your pig is to present the animal to its best advantage. Your extra effort may not make a mediocre pig a champion, but proper grooming and showmanship may make a difference of two or three placings in stiff competition.

BEFORE THE SHOW

Proper fitting began when you selected a good meaty pig. You continue fitting through proper management and feeding. During the growing period, work with your pig to get it used to you. Use a cane or whip to teach it signals to move and turn.

To guide your pig, train it to the following signals:

To turn left, tap the pig on the right side of its head.

To turn right, tap the pig on the left side of its head.

To stop, place the cane or whip in front of its snout.

To start, tap the pig on its side. (Do not hit your pig on the back, or ham. This will make the pig drop its back or tail.)

Never abuse your pig.

Proper grooming starts at least 2 weeks before the show. If your pig's feet need trimming, don't cause sore feet by cutting too deeply. You can often correct the pig's stance or walk by corrective foot trimming. Many pigs inherit small inside or outside toes. This fault will cause a pig to stand narrow or splay-footed.

A week before the show, you may want to clip your pig. If your pig is coarse-looking, clip the ears and tail; however, if the pig is refined, do not clip it. If you do want to clip, remove the hair from both the inside and outside of each ear to where the ear protrudes from the head. The tail is clipped from the tail root to 2 inches from the end of the tail. To reveal the prominence of the gilt's underline, clip the lower area on the belly.

Wash the pig about 1 week before the show. Use a mild soap or detergent. Remove all the soap from the skin and do not allow water into your pig's ears. Use a soft brush, and groom the hair so the pig looks muscular and trim.

PLAN AHEAD

Before the show, depending on the show's requirements, make sure you are properly entered. This usually means that you fill out an entry blank and send it to the show committee. Your county extension agent will help you fill out the entry forms. Many shows will require breed registration papers on purebred pigs. Health papers are required and may be obtained by checking with your veterinarian.

- Don't overcrowd your pig when you are transporting him to a show. Make sure you have adequate bedding during cold weather, and have wet sand for a summer session. A cover over the truck will protect your pig during all seasons. Be sure air can circulate to prevent overheating.
- When loading, use a chute to avoid injury. Do not excite or frighten your pig.
- If you are going to show a group of pigs (such as a litter or pen of barrows), take at least one set of hinged hurdles to the show (figure 14). It will help you keep your pigs separate from other pigs when in the show ring. It can also be used to allow you to feed your pigs outside their pen if they have to be at the fair more than 1 day.
- If you are going to show a boar, make a hand hurdle to keep him away from other boars in the ring (figure 15).
- Be sure gilts are penned separately from boars. Even if your gilts have not been coming into heat at home, the change of surroundings will often cause them to do so, and if they are with boars, they may get bred.

Figure 14. Hinged hurdles help keep pigs separate in the show ring.

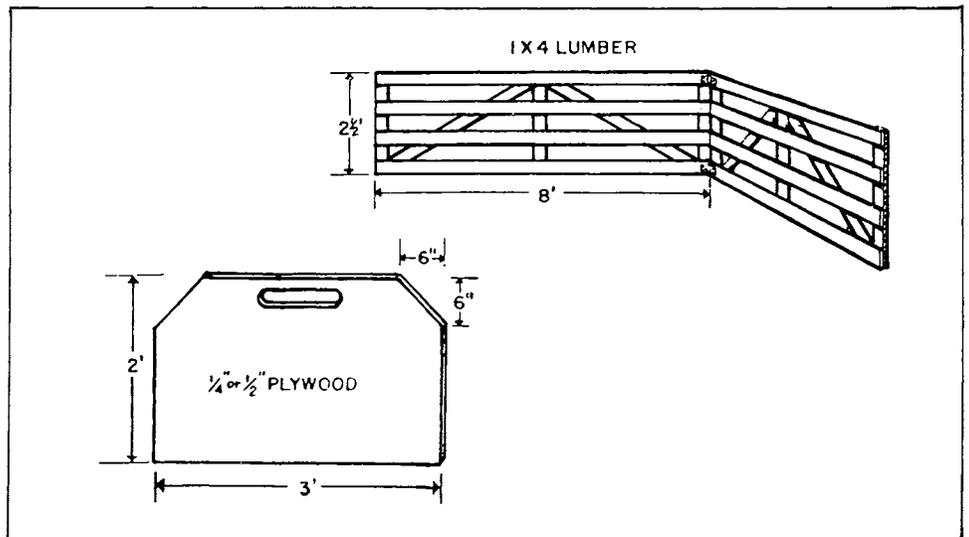


Figure 15. Hand hurdle used to keep a boar from other boars in the show ring.

AT THE SHOW

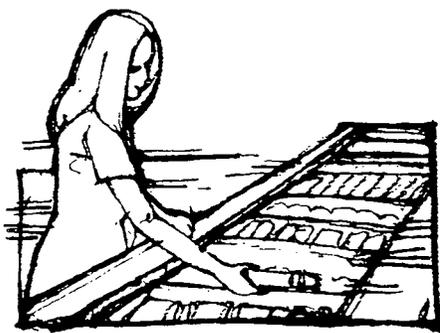
- After arriving at the show, water and rest your pig 6 to 12 hours before feeding and then feed only about one-half the regular amount. Feed slightly more on succeeding days, but never give a full feed.
- If the weather is hot, use a fan. If necessary, sprinkle the pig lightly with water on its nose and sides. Never pour cold water over a pig's back or it may die. Do not use straw bedding. Substitute sand or wood shavings if either is available, or let the pig lie on the bare floor. If the weather is cool, use drapes around the pens at night to protect it from drafts.
- If facilities are available, wash your pig the day before the show. Make sure ears, tail, and feet are clean, but be careful not to get soap or water into the animal's ears.
- If the show lasts several days, you may need to exercise your pig. The best time is usually late in the evening when it is cooler.
- Keep your pens and the area around your pens clean and neat.
- Have all the equipment you will need for show day ready the night before.

SHOW DAY

- Feed your pigs lightly (half feed or less) at least 2 hours before the show. A limited feeding will keep your pig active and alert. Proper fill, or the amount of water and feed eaten, is an important part of fitting and showing.
- Groom your pigs. If they are black, red, or spotted, use a light oil, such as light-weight mineral oil or a commercial preparation. Apply the oil with a fly sprayer or a wool rag. Oil the pigs evenly and completely, but lightly. For white hogs, use white talcum powder or cornstarch. Brush the powder to make an even distribution over the entire body. For Berkshire, Poland China, and Hampshire pigs, you may wish to use white talcum on the white parts and oil on the black area. If the weather is hot, do not oil your pig, but wet it down with water.
- When the pig is ready, get yourself ready. Wear clean and neat clothing in the show ring.
- Know your pig and the important information about it, including farrowing date, weight (if a barrow), and the number of teats on each side (if a gilt). Know what view of your pig looks best.
- Just before going into the show ring, give your pig a small drink of water. If you give it too much water, the pig will be too big in the stomach area and will not show well.
- Be prepared to go to the show ring as soon as the class is called.

IN THE SHOW RING

- Drive your pig so he will show at his best. This usually means walking at a natural gait approximately 10 to 15 feet from the judge. Always keep your pig between you and the judge. Carry a small cane or whip in one hand, and have a small brush in your pocket. If you use a cane, hold the straight end and guide your animal with the curved end. Keep your hands off its back, and never hit the pig on the back, rump, or snout. Keep your pig out of the corners, away from the fence, and out of large groups of hogs. Keep your pig in an open area where the judge can get a good view.
- Be courteous to the judge and to other exhibitors. If you win, be happy and proud, but not boastful. If you lose, be a cheerful loser and congratulate the winner. Learn from your mistakes, so you might be a winner the next time. Keep working and fulfill the motto "make the best, better."



the pork carcass

The pork carcass represents the end product of the swine business. Young swine producers must be interested in producing a quality product. This is a lean, juicy cut of pork that the homemaker wants to buy. In addition to producing a good carcass, it is also important for the pig to gain well and to be efficient at converting feed to lean pork. You must consider breeding, herd health, and management if you are going to raise healthy, fast-growing pigs that are profitable.

The wholesale cuts of meat with the greatest economic value are the ham (leg), loin, bacon (belly), boston shoulder, and picnic shoulder. You should obtain carcass cutout data from the packing company when you sell your pig. The measurements you need are: live weight before slaughter or shipping, chilled carcass weight, length, fat thickness over the loin eye, loin-eye area, and backfat. For more information in carcass evaluation, see Extension Bulletin 364, *Pork Improvement Through Carcass Evaluation*.

PORK NUTRITIONAL VALUE

Today's pork is superior because of improved breeding and feeding by producers and closer trimming by meat packers and retailers. Comparing the nutritive value of pork produced today to pork produced 20 years ago, we find more edible pork per pound with more body-building proteins and less fat.

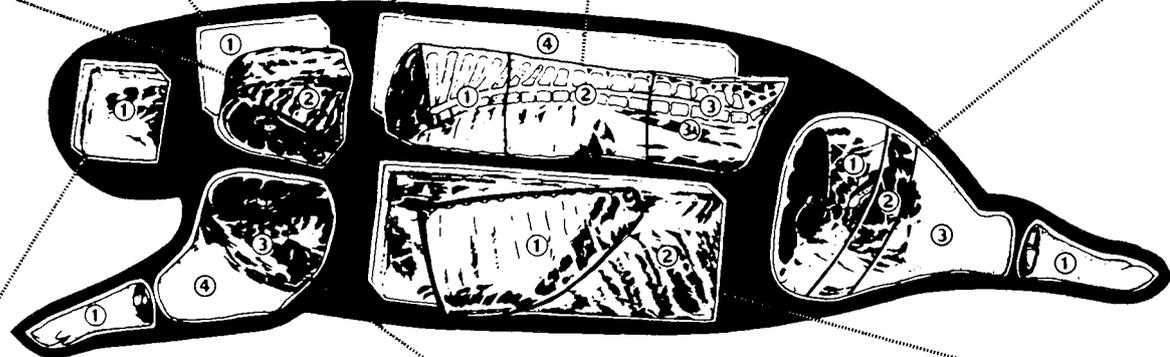
PORK CHART

RETAIL CUTS OF PORK — WHERE THEY COME FROM AND HOW TO COOK THEM

Porklet* (Cube Steak)	Pork Cubes
— Braise, Broil, Cook in Liquid —	
Blade Steak	Smoked Shoulder Roll
— Braise, Panfry —	
Rolled Boston Roast	Fat Back
— Panfry, Cook in Liquid —	
Boston Roast	Lard
— Roast —	
BOSTON SHOULDER	
1 CLEAR PLATE	
4 FAT BACK	

Blade Chop	Rib Chop	Loin Chop	Sirloin Chop
Porklet* (Cube Steak)	Butterfly Chop	Top Loin Chop	Sirloin Cutlet
— Braise, Broil, Panbroil, Panfry —			
Country Ribs	Back Ribs	Smoked Loin Chop	Canadian-Style Bacon
— Roast (Bake), Braise, Cook in Liquid —		— Roast (Bake), Broil, Panbroil, Panfry —	
Rolled Loin	Rolled Double Loin	Tenderloin	
— Roast —		— Roast (Bake), Broil, Braise, Panfry —	
Blade Loin	Center Loin	Sirloin	
— Roast —			
LOIN			

Rolled Leg (Fresh Ham)	Sliced Cooked 'Boiled' Ham
— Roast —	
Boneless Smoked Ham	Canned Ham
— Roast (Bake) —	
Boneless Smoked Ham Slices	Center Smoked Ham Slice
— Broil, Panbroil, Panfry —	
Smoked Ham, Sirloin (Butt) Portion	Smoked Ham, Shank Portion
— Roast (Bake), Cook in Liquid —	
LEG (FRESH OR SMOKED HAM)	



Bacon Square
— Cook in Liquid, Broil, Panbroil, Panfry —
Pig's Feet
— Cook in Liquid, Braise —

Fresh Picnic	Smoked Picnic	Arm Roast	Ground Pork*
— Roast —		— Roast (Bake), Panbroil, Panfry —	
Fresh Hock	Smoked Hock	Neck Bones	Arm Steak
— Cook in Liquid, Braise —		— Cook in Liquid, Braise —	
Link	Sausage*	Roll	
— Panfry, Braise, Bake —		— Panfry, Braise, Bake —	

Spareribs	Slab Bacon
Salt Pork	Sliced Bacon
— Bake, Broil, Panbroil, Panfry, Cook in Liquid —	
1 SPARERIBS 2 BACON (SIDE PORK)	

*May be made from Boston Shoulder, Picnic Shoulder, Loin or Leg.



The protein of a 3½ ounce serving of cooked lean pork contains all of the essential amino acids necessary to build, maintain, and repair body tissues and to increase its resistance to infections and disease (table 19, p 35). The minerals, iron, together with high quality protein, are vital in the formation and maintenance of red blood and in the prevention of anemia. Pork liver supplies about three times as much iron (29 mg) in available form as does any other food source.

Pork is a major dietary source of the B vitamins, especially thiamine, riboflavin and niacin, which are essential to food utilization, appetite, and skin and oral health. Note the triple indemnity feature pork has in thiamine content which is three times as much as any other food source.

Because protein is not stored in the body, protein foods should be included in every meal each day. Pork is one of the most completely digestible and utilized foods. Every cut is tender, so it can be included in the diets of very old as well as very young people. Strained pork products for infants provide a high percentage of essential nutrients needed early in life.

With less fat and fewer calories, pork plays a particular role in the diet for weight control. Loin roast, pork chop, ham, tenderloin, and picnic shoulder are under 250 calories per 3½ ounce serving of cooked, lean meat. When meat is included in the diet, the dieter is less likely to be tired, hungry, and tempted to eat between meals (table 19).

Whether it is barbecued pork roast, ham, bacon, or leftover pork in a sandwich, you can be sure of the same outstanding nutritive values that mean so much to your health and well-being.

Table 1. Corn and feeder pig price influence on the market price needed to break even^a

Corn Price/bu.	Purchase price of 40 pound feeder pig							
	\$15	\$20	\$25	\$30	\$35	\$40	\$45	\$50
\$1.50	28.73	31.13	33.54	35.94	38.35	40.75	43.16	45.57
2.00	30.94	33.35	35.75	38.16	40.56	42.97	45.37	47.78
2.50	33.16	35.56	37.97	40.37	42.78	45.18	47.59	49.99
3.00	35.37	37.78	40.18	42.59	44.99	47.40	49.80	52.20
3.50	37.59	39.99	42.40	44.80	47.21	49.61	52.02	54.42

^aIncludes all feed, veterinary supply, and miscellaneous cash costs plus a \$7 return for labor and facilities.

Table 2. Heritability estimates

Level of heritability	Characteristic	Average percentage
High	Carcass length	60
	Percent ham (based on carcass weight)	60
	Backfat thickness	50
	Loin-eye area	50
	Percent lean cuts (based on carcass weight)	50
Medium	Meat tenderness	30
	Meat color	30
	Marbling in loin	30
	Firmness of meat	30
	Feed efficiency	30
	Growth rate (weaning to market)	30
	Five-month weight	25
Low	Weaning weight	15
	Number farrowed	10
	Number weaned	10
	Birth weight	5

Table 3. Guidelines for selecting breeding stock

Characteristic	Boars	Gilts
Age at 230 pounds	155 days or less	175 days or less
Pounds of feed required per hundredweight of gain	Less than 275 pounds	Less than 300 pounds
Probed backfat thickness	Less than 1 inch at 230 pounds	1.3 inches or less at 230 pounds
Cutout information on relatives:		
Carcass length	At least 29.5 inches	At least 29.5 inches
Backfat thickness	1.3 inches or less	1.5 inches or less
Fat thickness over loin eye	1.1 inches or less	1.3 inches or less
Loin-eye area	At least 4.75 square inches	At least 4.5 square inches
Percent ham and loin:		
Of live weight	At least 28 percent	At least 28 percent
Of carcass weight	At least 40 percent	At least 40 percent
Percent muscle	At least 50 percent	At least 50 percent
Soundness:		
Underline	Minimum of 12 functional teats	Minimum of 12 functional teats
Feet and legs	Straight, well-placed, strong	Straight, well-placed, strong

Table 4. Average Litter Size by Breeds^a

Breed	No. of Litters	Av. Litter Size
Yorkshire	338	10.54
Landrace	192	10.52
Duroc	4,987	9.61
Chester White	2,274	9.54
Spotted	529	8.78
Hampshire	848	8.72
Berkshire	177	8.07
Poland China	3,298	8.07
Total	12,643	
Average		9.12

^aComposite of various research station and U.S.D.A. reports.

Table 5. Average Daily Gain and Feed Efficiency for Boars Tested to 220 Pounds^a

Breed	Number of Boars Tested	Average Daily Gain (pounds)	Feed Efficiency (lbs. feed/cwt. gain)
Berkshire	310	1.98	269
Chester White	1,017	1.89	261
Duroc	6,334	2.06	252
Hampshire	4,127	2.03	257
Landrace	172	1.92	279
Poland China	528	1.96	265
Spotted	1,521	2.02	262
Yorkshire	3,760	2.03	254
Total	17,769		
Average		2.03	256

^aSummary of 20 Central U.S. Test Stations in years 1972-1975.

Table 6. Carcass Data by Breed Adjusted to 220 Pounds^a

Breed	Number of Pigs Tested	Carcass Length (inches)	Backfat Thickness (inches)	Loin-Eye Area (sq. in.)
Berkshire	135	30.8	1.25	4.77
Chester White	228	30.6	1.24	4.76
Duroc	828	30.8	1.23	4.63
Hampshire	562	31.3	1.09	5.17
Landrace	121	31.1	1.39	4.46
Poland China	170	30.3	1.22	5.23
Spotted	457	31.0	1.26	4.97
Yorkshire	435	31.5	1.25	4.72
Total	2,936			
Average		30.9	1.22	4.89

^aComposite of data collected on National Barrow Show and Minnesota Swine Evaluation Station in 1973-75 years.

Table 7. U.S. Swine Breed Associations

Breed	Name of Association	Address
Berkshire	American Berkshire Association	601 W. Monroe St. Springfield, IL 62704
Chester White	Chester White Swine Record Association	817 E. Ninth Street Rochester, IN 46975
Duroc	United Duroc Swine Registry	1803 W. Detweiller Peoria, IL 61614
Hampshire	Hampshire Swine Registry	1111 Main Street Peoria, IL 61606
Landrace	American Landrace Association, Inc.	Box 111 – 112½ Culver, IN 46511
Poland China	Poland China Record Association	501 E. Losey, P.O. Box 71 Galesburg, IL 61401
Spotted	National Spotted Swine Record, Inc.	110 W. Main Street Bainbridge, IN 46105
Yorkshire	American Yorkshire Club, Inc.	1001 South Street Lafayette, IN 47902

Table 8. Composition of Various Feedstuffs^a

Ingredient	TDN %	Dig. Energy Kcal./lb.	Crude Protein %	Crude Fiber %	Calcium %	Phosphorus %
Energy Feeds						
Barley	70	1400	11.6	5.6	0.05	0.31
Corn (yellow)	80	1600	8.5	2.0	0.02	0.31
Oats	65	1300	11.8	11.0	0.10	0.35
Sorghum (milo)	78	1570	9.0	2.0	0.04	0.29
Wheat	80	1600	12.7	3.0	0.05	0.36
Protein Supplements						
Alfalfa meal (dehy.)	32	650	17.9	24.3	1.33	0.24
Cottonseed meal	61	1230	41.0	12.0	0.16	1.20
Fish meal (Menhaden)	71	1420	61.3	1.0	5.49	2.81
Linseed meal	67	1350	35.1	9.0	0.40	0.83
Meat and bone meal (50%)	65	1300	50.6	2.2	10.60	5.10
Skim milk (dry)	86	1720	33.5	0.2	1.26	1.03
Soybean meal (44%)	75	1500	45.8	6.0	0.32	0.67
Soybean meal (50%)	77	1550	50.9	5.6	0.26	0.62
Tankage (60%)	56	1125	59.8	2.0	5.90	3.20
Wheat bran	57	1140	16.0	10.0	0.14	1.17
Whey (dry)	78	1560	13.8	—	0.87	0.79
Forage						
Alfalfa hay	30	—	15.6	28.2	1.48	0.23
Corn silage	18	366	2.1	6.4	0.08	0.08
Sorghum silage	15	300	2.3	7.8	0.10	0.06
Mineral Supplements						
Bonemeal, steamed	15	300	12.1	2.0	29.00	13.60
Dicalcium Phosphate	—	—	—	—	22.20	17.90
Limestone	—	—	—	—	—	0.02
Monosodium Phosphate	—	—	—	—	33.84	22.00

^aNational Research Council Publication.

Table 9. Protein, Calcium, and Phosphorus Requirements of Growing Swine:

Pig Weight (pounds)	Protein (%)	Calcium (%)	Phosphorus (%)
40 to 75	15 to 16	0.7	0.5
75 to 125	13 to 14	0.6	0.5
125 to 240	12	0.5	0.4

Table 10. Balanced Growing Swine Rations

	Percent Protein in the Final Ration									
	16	16	15	15	14	14	13	13	12	12
Ground yellow corn, (lbs.)	1550	1615	1600	1527	1706	1635	1710	1643	1760	1725
Tankage, digester, 60% (lbs.)	—	120	—	—	90	80	—	—	—	50
Soybean meal, 44% (lbs.)	400	240	350	330	180	160	250	220	200	100
Dehydrated alfalfa meal, pounds, 17%	—	—	—	100	—	100	—	100	—	100
Dicalcium phosphate, (lbs.)	20	5	20	14	—	—	10	10	10	3
Ground limestone, (lbs.)*	20	10	20	19	14	10	20	17	20	12
Iodized, trace mineralized salt, (lbs.) ^a	10	10	10	10	10	10	10	10	10	10
Vitamin premix ^b	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)	(6)

^aProvide 100 ppm zinc and at least .008% iodine.

^bVitamin premix table 12 (carrier is 6 lbs. S.B.O.M.).

Table 11. Prebreeding Season Swine Rations

Ingredient (air dry)	Ration		
	1	2	3
Ground yellow corn ^a	80.6	75.6	53.3
Ground oats	—	—	30.0
Soybean meal, solvent, (48.5%)	16.2	8.2	13.4
Meat and bonemeal, (50% protein)	—	5.0	—
Dehydrated alfalfa meal	—	10.0	—
Dicalcium phosphate	1.2	0.2	1.3
Ground limestone	1.3	0.3	1.3
Trace mineralized, iodized salt ^b	0.7	0.7	0.7
Vitamin premix ^c	+	+	+
Composition			
Protein (%)	15.0	15.0	15.0
Calcium (%)	0.8	0.8	0.8
Phosphorus (%)	0.6	0.6	0.6

^aPartial or complete replacement by ground barley or milo is feasible.

^bProvide 100 ppm zinc and at least .008% iodine. (Parts per million X .907 = grams per ton.)

^cVitamin premix (Table 12). Add 10 lbs./ton.

Table 12. Vitamin Premix

Ingredient	Amount in 10 Pounds of Premix
Vitamin A, I.U.	6,000,000
Vitamin D, I.U.	400,000
Vitamin E, I.U.	17,000
Vitamin K, gm.	3.3
Choline Chloride, gm ^a	170
Niacin, gm	27
D-calcium pantothenate, gm.	20
Riboflavin, gm	4
Vitamin B ₁₂ , mg	12
Carrier (soybean meal) ^b	To make up a total of 10 lbs.

^aAdd 3 lb. choline chloride (25% choline)/ton to gestation ration.

^bUse corn as carrier in Ration 3-5 gestation ration and Ration 2 prebreeding ration.

Table 13. Pregnant Sows and Gilts Rations

Feed Ingredient	Hand-Feeding Rations			Self-Feeding Rations	
	1	2	3	4	5
Ground yellow corn ^a	80.4	83.0	75.5	26.0	—
Soybean meal, solvent, (48.5% protein)	16.2	10.4	8.2	4.0	5.0
Meat and bone scraps, (50% protein)	—	5.0	5.0	4.0	4.0
Dehydrated alfalfa meal, (17% protein)	—	—	10.0	—	—
Ground oats	—	—	—	20.0	15.0
Ground ear corn	—	—	—	—	35.0
Ground alfalfa hay	—	—	—	45.0	40.0
Dicalcium phosphate	1.4	0.1	0.2	0.5	0.5
Ground limestone	1.3	0.8	0.4	—	—
Salt (trace mineralized- iodized)	0.7	0.7	0.7	0.5	0.5
Vitamin premix ^b	+	+	+	+	+
Composition					
Protein (%)	15	15	15	15	15
Calcium (%)	.9	.9	.9	1.2	1.2
Phosphorus (%)	.6	.6	.6	.6	.6

^aGround barley or milo can replace corn.

^bVitamin premix table 12. Add 10 lbs./ton (In ration 3-5 use corn as carrier).

Table 14. Sow Farrowing and Lactation Rations

Ingredient	Period When Fed	
	Farrowing	Lactation
Ground yellow corn ^a	65.0	78.5
Soybean meal, solvent, (48.5% protein)	10.0	18.5
Tankage, digester (60% protein)	3.0	—
Linseed meal	5.0	—
Dehydrated alfalfa meal	5.0	—
Wheat bran	10.0	—
Dicalcium phosphate	0.5	1.3
Ground limestone	1.0	1.2
Salt (trace mineralized- iodized) ^b	0.5	0.5
Vitamin premix ^c	+	+
Composition		
Protein (%)	16.0	16.0
Calcium (%)	0.84	0.80
Phosphorous (%)	0.59	0.55

^aGround barley or milo can replace corn.

^bProvide 100 ppm zinc and at least 0.008% iodine.

^cVitamin premix (Table 12). Add 10 lbs./ton.

Table 15. Swine Daily Feed and Water Consumption.

	Growing Pig					Sow Gesta- tion	Sow Plus Litter	Herd Boar
	(10-25 pounds)	(25-30 pounds)	(50-75 pounds)	(75-125 pounds)	(125-210 pounds)			
Approximate daily feed consumption (lb.)	½ to 1	2.0	3.0	5.5	6.8	4 to 5.5	9 to 12	5 to 7
Water required per day (gal.)	.50	.75	1.00	2.00	2.50	4.5	6	5 to 7

Table 16. Swine Worming Program

Product	Feeder Pigs	Growing Pigs	Sow and Gilt		
			Prior to Breeding	Prior to Farrowing	Boar
Dichlorvos (atgard)	14 days after arrival. Repeat 30 days later.	25 to 30 pounds body weight. Repeat 30 days later.	7-10 days	7-10 days	7-10 days
Tramisol	14 days after arrival. Repeat 30 days later.	25 to 30 pounds body weight. Repeat 30 days later.	7-10 days	7-10 days	7-10 days
Piperazine	14 days after arrival. Repeat 30 days later.	40 to 50 pounds body weight. Repeat 30 days later.	10-14 days	10-14 days	10-14 days

Table 17. Boar Service Capacity

Age	Maximum Services per Boar		
	Day	Week	Month
Less than 6 months	0	0	0
6-9 months ^a	1	4	15
10-12 months	2	8	25
Over 12 months	3	12	35

^aUnder the "code of fair practices," boars over 6 months of age are guaranteed breeders.

Table 18. Breeding and Farrowing Schedule.

Breeding Dates	Jan. 1	Jan. 15	Feb. 1	Feb. 15	Mar. 1	Mar. 15	Apr. 1	Apr. 15	May 1	May 15	June 1	June 15
Farrowing 115 days	Apr. 25	May 9	May 26	June 9	June 23	July 7	July 24	Aug. 7	Aug. 23	Sept. 6	Sept. 23	Oct. 7
Weaning at 35 days	May 30	June 13	June 30	July 14	July 28	Aug. 11	Aug. 28	Sept. 11	Sept. 27	Oct. 11	Oct. 28	Nov. 11
Marketing 165 days	Oct. 7	Oct. 21	Nov. 7	Nov. 21	Dec. 5	Dec. 19	Jan. 5	Jan. 19	Feb. 4	Feb. 18	Mar. 7	Mar. 21
Breeding Dates	July 1	July 15	Aug. 1	Aug. 15	Sept. 1	Sept. 15	Oct. 1	Oct. 15	Nov. 1	Nov. 15	Dec. 1	Dec. 15
Farrowing 115 days	Oct. 23	Nov. 6	Nov. 23	Dec. 7	Dec. 24	Jan. 7	Jan. 23	Feb. 6	Feb. 23	Mar. 9	Mar. 25	Apr. 8
Weaning at 35 days	Nov. 27	Dec. 11	Dec. 28	Jan. 11	Jan. 28	Feb. 11	Feb. 27	Mar. 13	Mar. 30	Apr. 13	Apr. 29	May 13
Marketing 165 days	Apr. 6	Apr. 20	May 7	May 21	June 7	June 21	July 7	July 21	Aug. 7	Aug. 21	Sept. 6	Sept. 20

**Table 19. Percentages of Daily Recommended Allowances*
(Based on 3½ oz. of Cooked Pork, Lean Plus Marble)**

		Protein	Calories	Iron	Thiamine	Riboflavin	Niacin
MEN	18-35 yrs.	41	8	35	86	17	23
	35-55 yrs.	41	9	35	103	18	26
	55-75 yrs.	41	11	35	114	22	29
WOMEN	18-35 yrs.	49	11	23	129	22	31
	35-55 yrs.	49	13	23	129	24	34
	55-75 yrs.	49	15	35	129	24	34
CHILDREN	1-3 yrs.	89	18	44	206	36	49
	3-6 yrs.	71	15	35	172	29	40
	6-9 yrs.	55	11	29	129	22	31
BOYS	9-12 yrs.	47	10	23	103	21	28
	12-15 yrs.	38	8	23	86	16	22
	15-18 yrs.	34	7	23	74	15	20
GIRLS	9-12 yrs.	52	11	23	114	22	29
	12-15 yrs.	46	10	23	103	19	26
	15-18 yrs.	49	10	23	114	22	29

*Moderately active age groups.

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