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Swine Production : A Manual for Pig Club Members

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SWINE PRODUCTION
A manual for pig club members
By DR. G. S. WEAVER AND C. H. THOMPSON
FOREWORD

This bulletin has been prepared for the purpose of supplying information on hog raising to South Dakota club members. It deals with selection, feeding, care and management, and common diseases of pigs, fat barrows, pure-bred gilts and brood sows. The compilation is by no means complete and reference bulletins, circulars and books are listed on the last page. It is hoped that the information given will help to create personal initiative and additional interest and aid in the success and judgment of 4-H pig club members.
INTRODUCTION

Pig clubs afford a real opportunity to farm boys who wish to become familiar with one of the most profitable and reliable industries in agriculture. Problems of selection, feeding, management and common diseases are taken up under the guidance of leaders who have a working knowledge of livestock production. This bulletin does not take up all angles of the subject. It may be necessary to make some adjustments to the subject matter as presented in this bulletin to fit the existing local conditions of a club boy. There are different systems used in the economical production of pork.

Boys who are going to gain the most experience and complete successful projects are the ones who will take their work seriously. They will derive much satisfaction from their work and will find that hogs respond to good care and treatment. Hogs multiply rapidly making it possible to build up a herd faster than with any other class of livestock. Hogs will produce more meat from 100 pounds of feed than any other animal. They grow to a marketable age fast, making a quick turnover on the money invested. This is a desirable feature for club members who have to borrow money for their first project.
Swine Production
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Fat Barrow Project

Selection of a Pig.

It is difficult to develop a top hog out of an inferior pig and the matter of selection is very important. Some knowledge of the proper typed animal will be necessary in order to select a pig that will develop into the kind of finished barrow that is most desired.

The following points in selecting a barrow are to be considered: The pig must have a strong, well-arched back. A pig with an extremely smooth side and shoulder is desirable. Wrinkles and creases tend to become more prominent as the pig grows which will detract from his smoothness and quality. The pig should have plenty of length and stretch; long, deep, uniform sides; plump, firm, deep hams; uniform width; trim jowl, and show quality and smoothness. A little, short chuffy, heavy-shouldered heavy-middled pig will not make a good showing when grown out. An attractive, firm, neat carcass is what the packer wants. A pig should have style and carry himself with ease and grace. A pig that is clumsy and awkward will be more so as a finished barrow and will not make a good showing. Select a pig that stands up well on his feet and has short pasterns. Do not let these points outweigh all others as they are not disqualifications any more than a swirl in fat stock. In close competition, however, crooked legs and weak pasterns may be the deciding factors.

Feeding.

Rations will be taken up later in the bulletin but the author wishes to mention the difference between feeding a fat and a breeding hog. Fat barrows in order to be fit for the early shows must be pushed from the
beginning. It has been found that the most rapid gains have been the most efficient with few exceptions. The daily gains per day are in direct proportion to the feed requirements per hundred pounds of gain, that is,

A good grade medium type barrow

the faster the gains the less feed it takes, other things being equal. It has been found that for every tenth of a pound extra gain put on by a pig per day, 11 to 12 pounds of feed is saved per 100 pounds of pork produced. For fast and economical gains the barrows should be fed balanced fattening rations supplemented with good pasture.

A good grade bacon type barrow

Purebred Gilt Project

A purebred gilt project lends itself to boys who would like to get started in the purebred hog business but are handicapped by a lack of finances, available space, equipment and the necessary experience. One or two gilts may be purchased from a breeder at weaning time. They should be handled in the same manner as other breeding pigs are handled and cared for, as taken up later in the bulletin under the sow litter project. The initial investment will be much less than if a bred gilt or tried sow is bought. The risk will not be as great and such problems as pasture and equipment can be taken care of temporarily without difficulty.
When a purebred gilt club is to be organized in a community it would seem feasible and practical from a business standpoint and for the convenience of the club members to buy gilts of the same breed. This method has its advantages in that the club members can get together and buy a good sire to be used on all gilts in the club. This plan is especially adaptable to communities where there are not enough good hogs of the different breeds, as otherwise, getting the gilts bred would be a problem.

The purebred gilt project will give the member some valuable experience in feeding, growing, fitting and showing. It will also bring him in contact with some of the problems that will have to be dealt with in growing a litter. This project is well worth consideration.

Sow Litter Project

Selecting the Breeding Stock.

Boys selecting purebred hogs for the first time are often confronted with a breed problem. There is no best breed. Lard types of hogs include the Poland China, Spotted Poland China, Hampshire, Duroc Jersey, Berkshire, and Chester White. Bacon breeds include the Yorkshire and Tamworth. The bacon type of hog is not prevalent in South Dakota. If the breeder has a personal preference the question is easily settled. If there is no preference, it would be well to select the most popular breed in the community which would facilitate the breeder in gaining popularity and establishing a reputation and cause more buyers to come into the community. It would also be easier to get good sires within the community.

Each different breeder may think he has the best breed because of size, disease resistance, rustling qualities, higher dressing percentage or faster gaining ability, but as for satisfying the market demands there
is a greater difference between families, strains and individuals within the breed than there is between breeds. All breeds have their good qualities.

It is a common belief that like begets like which means the desirable characteristics of a sow will be transmitted to her offspring. Unfortunately the same is true of the bad points which makes the breeding game a fascinating one because it can not be known exactly what will result from two matings, consequently one must select for the best to do the most constructive breeding. Beginners who do not have the ideal type in mind should secure the help of a competent person who has had experience and knows breed type and character. Getting started wrong may prove very discouraging to the beginner. Go to a good breeder to select foundation stock.

Correct type and breed character are probably the most difficult factors to be recognized in selecting a sow or gilt. They are something which cannot be described in words but must come thru contact and experience with good livestock. Select a sow that is feminine, as shown by her refinement and quality of head, smoothness of body, and sleek coat of hair. She should have a matronly, quiet, yet active disposition rather than a wild, mean, nervous temperament.

Distributing baby pork club pigs

Size for age is important. Plenty of length and stretch of body; long, deep, smooth, uniform sides; smooth shoulders; good width of back and loin; all combined with uniformity; deep, smooth, plump, firm hams; deep heart girth; wide chest floor; and straight, strong legs coming out of all four corners set on short, strong pasterns. Balance and symmetry
of these good points should yield a clean cut, breedy sow with vitality, ruggedness, and fecundity.

The sow should be healthy and thrifty, full of vim and vigor, and active. A clumsy, lazy, sluggish sow is more apt to crush her pigs and less apt to take enough exercise.

The underline is an important part in the selection of a brood sow. She should have at least 12 good teats. Some udders have blind or inverted teats which should be avoided. A sow can handle no more pigs than she has good teats.

**Prolificacy.**

A sow of outstanding individuality is not necessarily the most prolific producer or one which will raise a good litter of 8 to 10 pigs. A sow that will not raise more than 4 to 5 pigs will not be the most profitable one. Select a sow from a good litter whose ancestors have been good producers. A sow that is an irregular breeder, poor suckler and lies on her pigs is not a profitable breeder and can usually be associated with the short-middled, chunky type, lacking in refinement and breed character. Pedigrees and ancestors should not be overlooked in choosing a brood sow because they play equally as important a part as individuality.

Careful observation will reveal that those who make the most successful livestock men have sought the approved type and pedigree plus productivity. In other words, the progeny test has been applied plus a feeding ration which meets the demand of the sow or gilt. It has also been clearly demonstrated that there is a direct relationship between sanitary conditions and the mortality of the pig crop.

Old sows are usually discriminated against by many breeders and not retained in the breeding herd, however, an old sow will usually farrow a larger litter than she did as a gilt. Gilts which prove to be prolific producers of the approved type can be retained in the herd profitably until their state of production has been impaired or their offspring cease to be of the right kind.

Club members should constantly bear in mind that the fertility of a sow is governed by hereditary force and the only logical way of retaining a high state of prolificacy is thru rigid selection. This selection must be made on the basis of productivity thru the introduction of new blood by individuals of approved type and prolific ancestors.

**Kind of Boar to Select.**

Breeders who have reached the top in the purebred hog business and have really contributed something worth while to the breed in the way of type and foundation stock can usually trace or attribute the cause to one factor, a prepotent sire. A prepotent sire is usually termed a strong breeder. He has the power of transmitting his good points to the progeny.

If you are buying an untried sire, consider the performance of his nearest relatives and ancestors. The boar may be just a happenstance or one that is not capable of transmitting his good qualities to the offspring. Many grand champions in every breed are lost or forgotten after their show days are over for this very reason. Well bred, prolific families of the correct type are always the safest families from which to select a sire.
Show records may be misleading. Should a boar be selected that has a string of ancestors that have all been show ring winners or should a boar be selected that will niche properly with the breeding herd? There is no best boar that will satisfy a number of breeders. One herd of sows may have a number of weak backs while the other contains many weak-footed sows. A boar should be particularly strong in the points where the sow is weak. Such being the case there are many good breeding boars.

Breeders do not always get what they are looking for when they make a selection. Unfortunately a sire has to have a crop of pigs to his credit before his true value or worth can be estimated with any degree of accuracy. The real good sires of potent caliber can best be secured thru very careful matings of sires and dams that have the ability to carry on. You have often heard the statement that the sire is more than half of the herd. Even though such be the case, he can only transmit the frame work to the offspring and the rest must be done by the feeder thru feeding. Pick a sire with a strong, active masculine appearance. A plain boar weak in breed character is less apt to be a strong breeder. Strong back, plenty of bone, short pasterns, smooth shoulders, large hams combined with a smooth body of quality, balance and symmetry are points to keep in mind when selecting a boar of proper breed type and character.

A pig club meeting with practical application

If an old boar of excessive weight is to be used on gilts it will be necessary to use a breeding crate. There are different kinds on the market which vary in price. They can be homemade to give satisfactory results. By writing for Farmers' Bulletin 966, U. S. Dept. of Agriculture a good plan of a breeding crate may be secured.

Breeding Season.

It is desirable to breed sows for early March farrowing when possible if one plans to show the pigs in the following fall or sell them for
breeding. The gestation period for a hog being 112 to 114 days would mean that November 10 breeding will give a March 1 farrowing date. Sows vary in the gestation period. Sometimes they will carry over a week or farrow three or four days before they are due. Early farrowing will give greater size for the fall shows and the breeding stock will be easier to sell. It is natural that everyone wants the biggest they can get for their money.

A sow should be studied and analyzed thoroughly before being mated with a boar. Pick out her weak points. She may lack a little in stretch, be too open in the shoulders, too long in the pasterns, or be a late maturing type or she may lack some of the easy feeding qualities. After all of these weaknesses have been considered mate her to a sire strong in points that the sow is weak in, with hopes that the mating will give something better than was obtained the previous generation. Matings do not always niche as expected. It sometimes requires considerable experimenting before the proper mating is found. Some prominent breeders retain old broken down sows that do not look good. Why are they retained in the breeding herd? Such sows will be found to be foundation stock, and have contributed considerably to the breed. The owner realizes their value and is not anxious to sell such producers as long as they are money makers.

Inbreeding is the mating of animals which are very closely related, such as parent to son or daughter, or brother to sister. Line breeding includes matings which have less than 50 per cent of blood in common. Inbreeding should be practiced only by breeders who are experienced and have a very good knowledge of the ancestry of the breeding stock. It is true that it is the quickest way of establishing type and obtaining desired results but the practice is a very hazardous one and more often results in failure than success unless the breeder has a thorough understanding of genetics. Families which are intensely bred for several generations are likely to develop constitutional weakness, sterility, non-resistance to disease, and decline in size and fecundity. In mating related animals there is a greater possibility of getting offspring more like the parents. But if there should be undesirable characteristics in the animals or in their ancestors, there is a double chance of the weakness appearing in the next cross. Anything may happen with inbreeding. It would be an unwise practice in breeding for market stock.

The most common practice used in breeding operations and without question the safest for beginners to use is outcrossing. Outcrossing is mating animals which are not related. It is, therefore, necessary for you to know the breeding of the females in order to buy a boar which bears no relationship. Learn to read a pedigree intelligently.

You may have a Duroc Jersey sow and wish to cross her with a Poland China boar. Such a mating is called crossbreeding and may result in faster gaining, more vigorous pigs than their ancestors. This generation should not be kept for breeding stock, however, because the hereditary material becomes so complex that it is not a sound practice.

Breeding gilts should not be bred until they are 8 months of age. This gives them a chance to be well grown before they farrow their first litter. Gilts which farrow too young are often small and undersized and have difficulty at farrowing time. If gilts are to be retained in the
breeding herd they will develop into larger sows if not bred for fall litters. After a sow is two years old she is fully capable of producing two litters a year. Many breeders, however, raise two litters from a yearling sow.

Flushing a sow is the practice of feeding the sow so that she will be gaining in weight at the time of breeding. Feeding the sow a balanced ration two weeks before breeding will put the sow in good physical condition. The sow should be gaining in weight as she is the one that will determine the size of the litter and not the boar, granting he is in good breeding condition and not used too much. The number of ova produced in the reproductive organs of the sow have the greatest bearing on the size of litter.

A mixture which might be used for flushing would include 50 pounds tankage, 25 pounds linseed oil meal and 25 pounds alfalfa meal, fed liberally along with corn. In experiments, gilts fed such a mixture averaged 8.8 pigs per litter while those fed corn alone averaged 7.6. In a similar experiment gilts were fed corn alone and averaged only 5 pigs while those receiving buttermilk and tankage in addition averaged 9 and 10 pigs to the litter respectively.

Care of the Brood Sow During Pregnancy.

Weaning a litter of 8 or 9 big, strong, husky pigs from a sow requires a lot of attention to the sow before she farrows. The sow not only must have food for her own body but must supply the growing litter. The last six weeks of the pregnancy period are the most critical. The unborn litter is making its most rapid growth at this time so the sow will need large quantities of protein and mineral matter. A protein concentrate such as tankage or oilmeal should be added to the ration. The ration
should be bulky and of a laxative nature. Mineral mixtures which might be used will be taken up later. Oats are quite high in protein and supply bulk. Corn is high in fat or heat producing material but low in protein and calcium which is bone building material, and unless supplemented with other feeds which are high in its deficiencies, it does not serve the purpose for brood sow feeding. Alfalfa meal or hay is high in protein as well as containing considerable lime and phosphorus. If it is fed in the form of hay, racks built for that purpose should be used.

Do not allow the sow to become too fat. By that is meant that she doesn't belong in the fattening pen where she would receive too much corn. A sow that gets too fat sometimes becomes clumsy and lazy and will not handle herself so well at farrowing time. Do not take this point on condition to the opposite extreme because a sow must have some reserve to suckle a big litter.

Brood sows should have full access to good water at all times and their feeding should be handled in such a way that they will get plenty of exercise. Exercise will develop stronger litters and keep the sows healthier. The sleeping quarters of the sow should be dry, well ventilated, warm, well bedded, and free from drafts. If there are cold drafts and the bedding is allowed to become damp and dirty there is more danger of disease and sickness, especially flu.

Brood sows should not be allowed to run with other livestock, especially horses and cattle. There is a chance of their getting hurt and losing their litters. Do not compel them to go thru small doors, over high sills or
crowd the sleeping quarters which might be harmful to the udders or the developing litter. Gilts will require milk, tankage or other high protein feeds to develop their own bodies while older sows can get along well on equal parts of corn, oats and plenty of alfalfa. In other words it would be better to keep the old sows separate from the gilts if possible. Brood sows should be kept free from lice and mange which are especially bad in the winter months. A good hog oiler is a preventive. Mange is difficult to check if once started. It will be taken up later under diseases.

**Farrowing Time.**

The sow should be watched closely when she nears farrowing time. The record of the breeding date will tell when she is due. Before farrowing the pens should be cleaned and scrubbed out thoroughly with boiling lye water to destroy all worm eggs. Finish up by spraying with a disinfectant to kill germs and bed the pens lightly. If the sow is large and heavy, guard rails will help save the litter. Place the fender about 10 inches above the floor and 8 inches away from the side wall. It serves to protect the pigs from being crushed. The sow should be placed in her farrowing pen a few days before so that she may become accustomed to her new home and be contented. An unruly sow is more apt to kill her pigs. The udder should be bathed in warm water and a mild disinfectant in order that it will be free of worm eggs before the sow is placed in the clean farrowing pen. If the sow is properly handled and cared for before farrowing there should be little trouble at farrowing time. A young sow or gilt is going to be more nervous than an old sow and greater care should be exercised.

Sows should be fed very lightly the last few days before farrowing. The ration should be laxative to keep the bowels open and avoid a feverish condition. Cut out the corn and heavy grains and feed a light, thin slop containing feeds such as bran, shorts and oil meal. It is easy to tell within
4 to 6 hours of when a sow will farrow. She becomes restless and uneasy. The udder will be full of milk and she will be busy building a nest. If she is allowed to build her nest out around some old straw pile or shed and then moved, she will often become angry and restless and will be more likely to kill the pigs.

Someone should be on hand when the sow farrows. If after several hours the sow seems unable to farrow her pigs, a veterinarian should be called. If the weather is cold the pigs should be kept from chilling. Wipe the pigs dry with a soft cloth as soon as they are born and then place in a basket containing straw and a jug of hot water covered with a sack. When the sow is through farrowing see that the pigs all nurse. If pigs are kept away from the sow for a few days until she becomes quiet, they should be allowed to nurse frequently.

Managing the Sow and Litter After Farrowing.

For the first 24 hours after a sow has farrowed she usually does not require any feed as she is hot and feverish. Luke warm water should be supplied in liberal quantities. If the sow should fail to come to her milk, it will be necessary to give her plenty of milk producing food as soon as possible, such as skimmilk, ground oats, bran, middlings and oil meal. If the sow is normal the first few feeds should consist of a thin slop of ground oats and wheat middlings. Increase the feed in proportion to the size of litter and kind of milker the sow may be. The sow should be on full feed from 10 days to 2 weeks after farrowing. Half oats and half corn is much better than all corn for a suckling ration. Good alfalfa hay and a mineral mixture should be supplied. The little pigs should be watched very closely for scours which may be caused by getting too much milk, by dirty quarters or a radical change in the sow's ration. Cut down the ration im-

-Is it easy to care for a sow with this type of individual house

mediately if the pigs start to scour. Clean the pens every day if necessary.

By the time the pigs are a week or two old they will need exercise. Otherwise they may get too fat and thumps will follow. Fix the pen so they can get out in the alley and they will soon learn to play and take exercise. It is usually a good plan to keep the sow and her litter together as long as possible to prevent robbing. The older pigs will rob the smaller ones and cause runts.

The litter should be marked as soon after farrowing as possible to avoid
mistakes. Marking is necessary in order to pick the most prolific breeding stock for another year.

Pigs when born have eight sharp needle-like teeth, four on a side. If the litter is large they seem to enjoy fighting and chew each other about the mouth. This makes a bad source of infection and also irritates the sow. Sometimes the sharp teeth injure the teats and udder. Many successful herdsmen make it a practice to clip off these small teeth as soon as the litter is farrowed. Litters that do not fight will not need their teeth clipped. Great care should be exercised in doing the job in order not to injure the gums in any way. In other words not to cut the teeth too short. Use a sharp pair of cutters made especially for the cutting of teeth. A poor job is worse than leaving the teeth in the mouth.

When the litter has reached the age of 8 to 10 days the pigs are ready to be moved out on clean ground and pasture. It is just as important to do this job right as it is to clean up the sow and the farrowing pen. If the sow and litter are allowed to walk through the old yards which are contaminated with worm eggs and germs of infectious diseases, the benefits of clean quarters are lost. Haul the sow and litter out to her new quarters. A small economical individual house is the most satisfactory for the sow and litter. Keep the house clean and well bedded. Expensive and elaborate buildings are unnecessary. Rye, alfalfa, or bluegrass all make good early pasture for the sow and litter and greatly cheapen the ration. When the pigs have reached the age of two weeks the sow should be on full feed. The ration might consist of 60 pounds of corn, 35 pounds of ground oats and 5 pounds of tankage. Whole oats may be fed in place of
A good method of marking pigs
ground oats. Oil meal might take the place of part of the tankage. Barley could be substituted for the corn. The pigs should be able to handle all of the dam’s milk without danger of scours. If the sow is a heavy milker and not well fed she will go down fast in flesh. A good mineral mixture is necessary for the sow at this time.

By the time the pigs are two or three weeks old they will begin to eat with their mothers. At this time they should be provided with a creep of some sort where they can eat anytime without being disturbed by their mothers. If skimmed milk is available, it is an excellent food to start the pigs on. Ground feed or the same which their dams are receiving can be placed in a self-feeder for the pigs to learn to eat. By the time the pigs are old enough to wean they will have learned to eat and drink well enough and will not miss their dams much.

In constructing a creep the openings through which the pigs enter must be sufficiently high but they should be narrow enough to keep the old sows from entering. This system is more desirable than making the pig crawl underneath a board to enter a creep. If allowed to go back and forth into the creep without bending their backs the bad habit of sagging in the back can be eliminated. It is always the best policy to get as much growth as possible on the breeding stock so they should be pushed from the very beginning.

The use of the self feeder for both sow and litter after the pigs are about 3 weeks old might be considered. This type of feeder may not be available to the club member but if there happens to be one on the place it could be used to advantage. A self feeder is a labor saver. It is also a saver of feed. The United States Experiment Farm at Beltsville, Md., found that self-feeding compared with hand-feeding sows and litters took 162.03 pounds less feed to produce 100 pounds of gain (sow and litter).

Pigs should be castrated before they are weaned. It is not always possible to handle this practice satisfactorily with purebred stock because herdsmen are not able to tell just how the pigs are going to develop at such an early age. In this case it is probably better to let them go longer but under no consideration should a boar pig be kept for breeding purposes because he is well bred, or the dam cost a lot of money or some other similar reason unless he shows breeding type. There are poor pigs in the best of litters. Castrate the poor pigs because they are a detriment to the pure-bred business and to the hog business. Pigs that are castrated before they are weaned heal up much quicker because of less shock and loss of blood. Their mother’s milk will keep them coming. Pick a warm sunshiny day to do the work and be sure the pigs have a clean, dry place to sleep. Access to dust and mud holes is apt to cause infection and other complications. In castrating the pig, make the incision low enough to provide good drainage. Remove all or the greater portion of the cord. Prevent infection by using disinfectants and a clean knife.

Pigs should not be allowed to destroy good pasture by rooting it up. It is much more economical to place one ring in the center of each nose which will be sufficient to stop the rooting. Wet weather will usually start the pigs rooting as they like to dig for angle worms even if they have free access to protein supplement and minerals.

Weaning the Pigs.

A definite age cannot be set for weaning the pigs. The majority are
probably weaned from 8 to 10 weeks of age. Sometimes the pigs have been set back by bad weather, scours, thumps, or poor management and will do better if not weaned too soon. Pigs should weigh not less than 35 to 40 pounds before weaning and be accustomed to eating a good ration. If this be the case they will go on eating and gaining without their dam. Sometimes it is necessary to wean a litter young because the owner wants the sow rebred for an early fall litter. Sows will not usually come in heat while the litter is still small. If, however, the litter is kept separate from the sow for several hours during the daytime a week's practice may bring the sow in heat while nursing.

Cut down on the grain ration of the sow four or five days before weaning. This will have a tendency to decrease the milk flow if she is still milking heavy. It may be even necessary to turn the sow back to the pigs a few times after weaning to prevent injury to the sow’s udder thru the accumulation of too much milk. This should be watched in particular if the sow is to be retained in the breeding herd. Do not wean the pigs all at the same time if there is a big variance in size and age. Those that are weaned too young never do as well. The older pigs have too great an advantage when it comes to getting in the feed trough.

The South Dakota experiment station has found it a good practice to put the sow on a straight corn ration at the time her feed is cut down for weaning the pigs. By doing this and taking the pigs away from the sow in the morning, putting them with her for a half hour at noon and at night the first day, morning and night the second day and at noon the third day they have been able to avoid spoiled udders even in the case of the heaviest milking sows.

Feeding after Weaning.

As soon as the pigs are weaned, great care must be exercised in their feeding management. Milk from the dam is a food which cannot be equalled through other sources. Therefore, it will be necessary to use a ration which will contain more protein to take care of what was formerly supplied in the mother’s milk. If the pigs are well started at weaning time it will be a comparatively easy task to grow them up to six months of age. Early pastures are a great help to the hog raiser. Gains will be much cheaper and faster if the pigs have access to good alfalfa, clover, rye or rape pasture.

Just what the growing ration should consist of depends on many factors such as cost, equipment, availability, kind of pastures, time and other items. Every herdsman should use his best judgment because after all, profit is what determines the success or failure of any business. The breeding pig requires a ration which will supply the necessary growing materials for frame work, bone and muscle and not a fattening ration. Even in the case of market hogs, they should not be fed just a fattening ration when in the growing stage. If growing breeding pigs are pushed too fast they will not develop the type and conformation that is desirable for the show ring and breeder. Pigs that are pushed often break down on their feet and legs and become soft which is not desirable from a breed type and growth promotion standpoint.

The South Dakota experiment station has found the following ration to be excellent for pigs. It will be noticed that this ration contains quite
a high percentage of barley and since barley is one of the most common grown feeds, this ration will be found useful.

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<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Corn</td>
<td>50</td>
</tr>
<tr>
<td>Ground barley</td>
<td>25</td>
</tr>
<tr>
<td>Wheat middlings</td>
<td>16</td>
</tr>
<tr>
<td>Tankage</td>
<td>6</td>
</tr>
<tr>
<td>Oil Meal</td>
<td>3</td>
</tr>
</tbody>
</table>

If the pigs are weaned the corn can be either shelled or ground. This ration may be fed in a self-feeder.

The following rations expressed in pounds for 100 pounds of mixture have been successful in growing out young pigs for breeding stock:

1. Ground corn 50  3. Ground corn 50
   Ground oats 35    Wheat middlings 35
   Tankage 10        Tankage 10
   Linseed oil meal  5  Linseed oil meal 5

2. Ground corn 50  4. Ground oats 30
   Wheat middlings 15 Ground barley 30
   Ground oats 20    Ground corn 30
   Tankage 10        Linseed oil meal 5
   Linseed oil meal  5  Tankage 5

These rations are to be supplemented preferably with good legume pasture. If pasture is not available as might be the case for fall pigs, alfalfa meal or the third or fourth cutting of the hay fed in racks should be added. The corn does not necessarily have to be fed ground or in a mixture with the rest of the ration. It is usually cheaper and more convenient to feed it on the ear. If milk by-products are available they will add materially to the ration. The use of milk will, no doubt, be a big factor in bringing about the maximum daily gains.

The pigs should have free access to a self-feeder containing a good mineral mixture which can be homemade. Be sure that the mixture includes in an available form the following elements: Calcium, phosphorus, sodium and chlorine. Details will be taken up under minerals.

You have heard the term “balanced ration” used several times thus far and probably wonder just what its real meaning is. A balanced ration is a ration which supplies the several nutrients in such proportions and amounts as will properly nourish an animal. Generally speaking it refers to the ratio between the protein in a feed and the carbohydrates and fats. The last two are similar in composition so are grouped together.

Protein is the only nutrient which can produce growth and make repairs in the animal’s body. Lean meat, skimmed milk, wheat bran, cottonseed meal, and tankage are some of the feeds which contain relatively large amounts of protein.

Carbohydrates and fat are nutrients which produce fat, heat, and power to do work in the animal’s body. Fat is about two and one-fourth times as valuable for these uses as carbohydrates. Feeds containing large amounts of starch and sugar are rich in carbohydrates, while large amounts of fat are contained in oily feeds. Corn is rich in both carbohydrates and fat.

Requirements for maintenance and growth of an animal depend on the size and age of the animal so it is readily seen that a balanced ration for hogs cannot be determined to meet the greatly varying conditions. Different feeds are not balanced but contain more of one nutrient than another. For instance, corn is relatively high in carbohydrates and fat.
but low in protein. It takes a variety of feeds to make up a balanced ration. Hog rations should contain such qualities as variety, bulkiness, palatability and succulency with the cost and availability of feeds taken into consideration.

**Value of Protein Supplements.**

The value of feeding protein supplements cannot be overemphasized. Too often not enough supplement is fed to the growing and fattening pigs. Rations which are efficient and economical are the ones that should be fed. There are a number of supplements from which to draw. Where corn is made the basis of the grain ration, combinations have proven more successful than the feeding of any one of the following supplements alone: tankage, linseed oil meal, peanut meal, soybeans, wheat middlings, bran, corn germ meal, fish meal, alfalfa meal, cottonseed meal, skim milk, cow peas, field peas and blood meal. Tankage, linseed oil meal and skim milk are the most commonly used in South Dakota. Price should determine which is your cheapest source of protein. There are many commercial feeds on the market which are good feeds and will give good results. Read the analysis on the sack, figure out what the protein is costing per pound, then compare the cost with such high protein feeds as tankage and oil meal.

The amount of protein to be fed depends on the feeding system. When the pigs are on good alfalfa, clover, or rape pasture, only about half as much supplement is required as when fed in a dry lot. Pigs which weigh over 100 pounds will need about five pounds of supplement for every 95 pounds of corn. It is not necessary, however, to feed supplements this way.

Feeding trials have been carried on to demonstrate the difference of feeding corn alone and corn with tankage along with rape pasture. Also a comparison of barley alone and barley with tankage on rape pasture has been demonstrated. These tests were carried out at the South Dakota experiment station. The pigs which received corn and rape pasture without tankage gained 1.17 pounds a day and required 431.54 pounds of corn for 100 pounds of gain. The pigs which received tankage with corn and rape pasture gained 1.57 pounds a day and required 338.49 pounds of corn for 100 pounds of gain. The pigs which received barley and rape pasture without tankage gained 1.28 pounds a day and required 473.8 pounds of barley to make 100 pounds of gain. The pigs which received tankage with barley and rape pasture gained 1.53 pounds a day and required 416.84 pounds of barley.

Other experimental work on the feeding of protein supplements has been carried out by the South Dakota station. Various combinations of protein supplements were tried under dry lot conditions to secure information which would make winter feeding of market pigs more profitable.

The standard ration of yellow corn and tankage is not a very efficient winter ration for fall pigs because these feeds do not supply sufficiently the vitamins which are so necessary for satisfactory growth and development. Fortunately, this practical and popular ration may be easily improved by the addition of alfalfa hay and linseed meal, or buttermilk.

The addition of chopped alfalfa hay and oilmeal to a ration of yellow corn and tankage greatly increased the efficiency of the ration. Pigs fed
this ration made an average daily gain of 1.54 pounds as compared to 1.32 pounds for pigs fed only corn and tankage.

Alfalfa hay fed in racks gave almost as good results as when added to the ration in the chopped form. When choice alfalfa was used, the gains were just as good. There seems to be little or no advantage in chopping alfalfa hay if pigs can be induced to consume sufficient uncut hay to insure beneficial results.

Corn and alfalfa hay alone did not prove an efficient ration showing that alfalfa hay cannot replace tankage as a supplement for corn.

A corn, tankage and buttermilk ration proved more efficient than either a corn and tankage ration or a corn and buttermilk ration. More rapid and cheaper gains resulted as well as greater uniformity and finish.

Semi-solid and condensed buttermilk were found to be good substitutes for creamery buttermilk in rations of corn, tankage and buttermilk. These feeds might be used to advantage where skim milk or creamery buttermilk are not available.

Where ground barley was substituted for corn in the ration with tankage, it proved satisfactory. One hundred pounds of barley were equal in value to 100 pounds of corn which graded No. 3 or No. 4. One could afford to feed barley and tankage instead of corn and tankage when the cost of a bushel of ground barley was not more than 83 to 87 per cent of the cost of a bushel of corn.

A very interesting experiment was carried on to demonstrate the value of feeding a mixture of protein supplements rather than just one. Shelled corn was the basic ration and was full fed. The following combinations of supplements were used:
1. Tankage.
2. Tankage 90
   Alfalfa 10
3. Tankage 50
   Linseed oil meal 50
4. Tankage 45
   Linseed oil meal 45
   Alfalfa meal 10

The average daily gains became greater and the feed requirement less in the order the rations are given.

The following conclusions can be drawn: When tankage was the only protein supplement added to corn and minerals for dry lot feeding, slower and more costly gains resulted than when mixtures were fed; each of the three mixtures was more efficient than tankage in producing gains at a lower cost; the mixture of tankage, linseed meal and alfalfa meal cost less per hundred weight and made the most rapid and the cheapest gains.

Forage Crops.

Forage crops as pastures play a big part in the economical production of pork. This question should be given proper consideration and thought long before the sow has farrowed her litter. Good pastures have demonstrated their worth and value in the pork producing program, consequently every boy should make arrangements for some kind of pasture for the pigs. It means a saving of from 10 to 15 per cent of the total amount of grain and supplement used while the forage crop lasts. A large number of feeding trials which have been conducted under different conditions to find out the comparative number of pounds of grain needed to produce 100 pounds of pork in dry lots as compared to the use of forage crops have given some wide differences. Pigs on rape pasture on an average required 39 pounds less corn and 20 pounds less tankage to produce 100 pounds of gain than those in a dry lot. It has been our experience that boys who are new at the game do not fully appreciate and realize the significance of good pastures. Pasture greatly reduces the amount of protein supplement that will have to be bought.

Alfalfa.—Alfalfa has a natural home in South Dakota and should be taken advantage of. It is the best permanent pasture crop available, coming on early in the spring and holding out until late fall. Alfalfa will stay green and succulent through hot, dry summers where other pasture crops, particularly blue grass, dry up and become nearly valueless. Alfalfa pasture is capable of carrying from 10 to 20 pigs per acre under normal conditions. It should not be pastured too close as alfalfa will not stand this sort of treatment. Give it a good start in the spring and do not pasture off too close in the fall as there is danger of winter killing. Some breeders make a practice of turning the pigs in a large field which is considerably more than they can handle. Two or three crops of hay are taken off the field in addition to pasturing the hogs. The pigs may range considerably at first but usually do most of their feeding off the corner closest to housing quarters.

Alfalfa is very high in protein, mineral matter and certain vitamins which make it a valuable forage crop for balancing the hog ration. Sows that have weaned their litters will need little grain in addition to alfalfa
pasture which is a cheap way of carrying them over. It is universally known as a great hog pasture.

Sweet Clover.—Sweet clover has probably gained more prominence in South Dakota as a green manure crop than as a pasture crop, yet it is quite extensively used in some sections. Pigs do not like it as well as alfalfa because it is not as palatable, having a somewhat bitter taste. Sweet clover is a biennial crop and is seldom used for pasture until the second year. It makes excellent pasture in the spring but often becomes too coarse and woody later in the season. Excellent fall feed can be gotten from sweet clover after the nurse crop has been removed from first year planting. Late summer rains bring it on in fine shape. Red clover is a very good pasture crop, rating next to alfalfa in value, but is grown very little in this state.

Rape.—Rape is the most popular emergency hog pasture crop that is grown. In spite of the fact that it is not a legume, it has given very satisfactory results as a pasture crop and compares favorably with alfalfa and clover. Hogs relish the crop and do well on it. It can be sown most any time during the growing season from early spring until the middle of July. It has nearly as large a carrying capacity as alfalfa. Cool and moist soil conditions favor its growth. Under favorable conditions rape will be ready to pasture in 6 to 8 weeks after seeding although preferably it should be 10 to 14 inches high. It can be pastured until frost kills the plants in the fall. If sown in the spring a pasture crop will be available by the time rye and blue grass have played out. Plow up the old hog lots and sow from 5 to 8 pounds of Dwarf Essex seed. Oats are sometimes mixed with the seed but this does not improve the pasture. Do not pasture rape too closely. If the pigs are getting the best of it, shut them out until new leaves have a chance to grow.

Bluegrass.—Bluegrass is not as desirable a pasture crop as the three previously mentioned because it is a slow growing plant and must be a permanent pasture proposition. Such pastures do not fit in well with the hog lot sanitation practice of South Dakota. Bluegrass comes on early in the spring and is relished by hogs but does not last. By midsummer it gets woody, tough, and unpalatable. Legumes contain considerable bone forming material which are decidedly lacking in blue grass. Alfalfa or rape can well be substituted for blue grass as a hog pasture in the state.

Mr. Turner Wright of the Animal Husbandry Department, State College, states the following in regard to bluegrass pasture.

“We have found bluegrass excellent for the rotation system for pigs farrowed in early March. If the bluegrass is not pastured or cut during the previous fall it will form a dry covering over the ground. The bluegrass comes on early in the spring. This makes the very best pasture I know of to put pigs on in March and early April. Blue grass sod and dry grass from the previous fall keep the little pigs out of the mud. By the time the bluegrass gets woody the pigs have a good start and can be moved into rape yards with practically no danger of worm infection.”

Rye.—Rye has a distinct advantage over other pasture crops in that it comes on exceptionally early in the spring and makes late feed if sown early in the fall. The food value of green rye compares quite favorably with that of rape. In some cases the laxative nature of green rye has
been quite pronounced, especially with young pigs but this does not seem to affect older hogs. It is questionable whether or not hogging off ripe rye is a profitable practice. Results have varied in experimental work. Rye should be sown at the rate of 6 to 8 pecks per acre.

Minerals for the Growing Pig.

Minerals are essential for the growing pig and should be fed in self-feeders of free choice style. The amount of minerals needed by a pig depends upon his ration. If he is getting an abundance of tankage, oil meal, milk and leguminous pastures, the amount of mineral required will be very small. Less than one-third of a pound a month per pig might be consumed. On the other hand where the above feeds are lacking or dry lot feeding is being practiced, the consumption may go up as high as 2, 3, and 4 pounds per pig a month. Most grain feeds that are commonly fed pigs are low in mineral and must be supplied from outside sources. Pigs grow fast and, therefore, require more mineral elements for developing the frame than most other classes of livestock.

Mineral elements which are most likely to be lacking in a ration are calcium, phosphorus, chlorine, sodium and iodine. Sodium and chlorine are easily taken care of by keeping salt before the pigs at all times. This is a general practice followed by all livestock men. Other possible deficiencies will have to be supplied from other mineral sources.

Calcium.—Hogs suffer more commonly from a calcium deficiency than any other mineral. Home grown grains are low in calcium. The lack of calcium or phosphorus in the diet of the growing pig often causes rickets. Calcium can be supplied either through ground limestone or air slacked lime in the form of a mineral mixture.

Phosphorus.—This element is necessary for the assimilation of calcium into the body. Animals which are lacking in phosphorus present about the same symptoms as those lacking calcium. If feeds such as bran, middlings, oil meal, tankage, and milk, which are high in phosphorus content are fed, there will be little danger of trouble from this source. Phosphorus may also be supplied in the form of raw or steamed bone meal or spent bone black.

Iodine.—Goiter (big neck) and hairless pigs at time of birth are indications that there is a lack of iodine in the ration. This lack may also cause other reproductive disturbances. A little potassium iodide added to the mineral mixture will correct the deficiency. This is especially important when the sow is carrying her litter to insure against hairless pigs.

Good results can be obtained from the following homemade mineral mixture which is simple and will supply the mineral deficiencies.

40 pounds of ground limestone or air slacked lime.
40 pounds of raw or steamed bone meal.
20 pounds of common salt.

One-half ounce of potassium iodide should be added to the mixture when it is being fed to brood sows. Two pounds of copperas, which is iron sulphate, may also be added to correct any iron deficiency.

Self-Feeding vs Hand Feeding.

We usually do not associate a self-feeder with the pigs which are to be grown out for breeding purposes but rather with those which are to be
put on the market. Self-feeders should not be used unless rapid gains are wanted. Therefore, self-feeders should not be used for growing pigs for the breeding herd and pregnant sows, unless some bulky ration can be fed. Ground alfalfa and oats may be used but even then sows may become too fat and the practice is questionable with many breeders. It may have a tendency to discourage the sows from taking exercise and likewise limit the value of a good pasture crop for growing pigs.

Self-feeding has shown distinct advantages over hand-feeding when used to put on fast economical gains. The gains have proven to be faster, less feed is required per 100 pounds gain and the hogs can be marketed sooner. In other words, time is saved which puts the hogs on an earlier fall market which is usually higher than in December and January. This means there is a quicker return on money invested, labor is saved, less feed is required and some risk is avoided. There are other advantages of the self-feeding method. It encourages a quicker finish, avoids the production of runts, promotes sanitation, and cuts down on the trough and feeding floor space necessary. Self-feeding also has its disadvantages in that the herdsman is more apt to neglect the herd, placing too much dependence on the feeder. It takes added equipment in the building of feeders and may take extra time in mixing feeds to take advantage of the modified free choice feeding which is mixing several feeds together, especially in the case of protein feeds to get the cheapest and best results.

**Hogging off corn is an economical method of putting on gains**

**Hogging Down Corn.**

The question of hogging down corn will be of interest to boys who have been in sow litter work several years and have gone into the production of pork on a commercial scale in addition to keeping up the breeding herd. It has its distinct advantages over hand-feeding because it is an economical way of fattening pigs and a great labor saver. Hogging down is not always possible because of the fencing problem and
location of fields on the farm. Hog-tight fencing is necessary. It is a practice that is carried out by many farmers in the corn and hog producing areas. Due to the fact that the feeding of a protein supplement at the same time is necessary for profit, it is a common practice to sow rape in the cornfield between the rows at the time of the last cultivation. If moisture conditions are favorable, rape will make a good growth and furnish an abundance of feed. Such a supplemental crop should not be depended upon alone, however, to furnish the necessary protein for the fattening ration.

If the pigs are small and the corn heavy, it may be necessary to drag down a little corn at a time until they are large enough to do their own picking. More value per acre will be gotten out of the corn if they are not turned in until the corn is in the dent stage. A small amount of some early maturing variety may be planted to furnish early feed. In sections where squaw corn is grown, hogging down is popular because of the difficulty of picking the corn.

Fencing off small sections of the field is a good practice as it may not be desirable to hog off the whole field. A temporary fence is easily made of woven wire by tying the wire to corn stalks. There may be some waste if older hogs are allowed to run in the corn during wet weather. Do not make the pigs husk every ear before more corn is fenced off because it will slow down the gains. If the pigs have access to a good alfalfa pasture a considerable saving in protein supplement will be made. Allow the pigs to run to a hog waterer. A self-feeder should be provided containing a good protein mixture such as tankage and oil meal. Early hogging down is far more desirable than late because if the pigs are not finished for October markets there is a usual decline in market prices with the usual heavy receipts on later markets.

Swine Diseases and Ailments

Scours.

Scours or diarrhea in little pigs is a common ailment and causes an extensive loss. The name of this condition characterizes the ailment. It is generally caused by irregularities in feeding or unsanitary conditions. It is common in this part of the country for the reason that weather conditions in the spring of the year are none too favorable for the little pigs.

The direct cause in most cases is due to an irregularity in the feeding of the sow. If a sow has not been accustomed to milk before farrowing and is given milk after the pigs are born it is liable to scour the pigs. If the sow is fed too soon after farrowing it is liable to cause trouble. Over-feeding will produce the same condition. Any sudden change of feed for the sow may be responsible. If the pigs are not kept dry and warm the condition may appear.

The chief symptom of scours is a profuse diarrhea. The discharge from the bowels is thin and white. At first the pig may nurse as if he were normal but later he will stop eating or nursing. The coat becomes rough and the skin is wrinkled. The pig will lie around indifferently to surroundings and if picked up or handled will squeal from pain. In a few days he will probably die. Some of the older pigs may recover but most of the little pigs die.
Treatment is largely preventive and consists mainly in correcting the feeding of the sow and keeping the pigs warm and dry. The sow should be brought up to full feed very gradually after farrowing. It may take a week to get her back on full feed. She should not be fed anything for 24 hours after farrowing. Lukewarm water may be given at any time. Milk should not be given the sow for several days after farrowing. The common statement among hogmen “Keep the pigs warm and dry” cannot be over-emphasized. The sick pigs may be given a dose of Epsom salts as a physic to remove the irritating substance in the bowels. Castor oil may be better as a physic—one teaspoonful to each sick pig. Even a teaspoonful of raw linseed oil may be given if no other treatment is available.

**Thumps.**

Thumps in pigs is a condition produced by sudden contractions of the diaphragm. It is not an ailment of the lungs and heart. It is common in pigs that are over-fat and under-exercised. Thumps is the same thing as hiccoughs in a person. It is a spasmodic contraction of the diaphragm. The diaphragm separates the lungs and heart from the stomach, liver and intestines.

Any irritation to the nerve that controls the diaphragm may cause a sudden contraction. This irritation may be produced by overfeeding. Pigs that are over fat and lack exercise are fit subjects. If the stomach of the pig is inflamed or the intestines are inflamed the pig may thump. Many other conditions or diseases might produce thumps but the most important are over-feeding and lack of exercise.
The condition is easily recognized by the sudden jerking of the pig. The sides of the pig will suddenly contract and the lung cavity will expand. There is a continued series of these jerking spasms. The condition is likely accompanied by constipation and loss of appetite. The spasms may be so violent and frequent as to cause death. In case the pig lives there will be considerable of a set-back in growth.

If the pigs are noticed in the early stages of thumps, it is probable that they can be brought out of the condition without serious difficulty. By all means the amount of feed given should be cut down either by taking the pigs away from the sows for several hours during the day or lessening the grain fed. Get the pigs in the sunlight. See that they have exercise even to the extent of running them up and down the alley-way. Give each sick pig a teaspoonful of castor oil.

**Round Worms.**

Internal parasites, of which the round worm is the most common, cause considerable disturbance in the digestive system of pigs. The infestation may be so severe as to cause death. At least the badly infested pig is given a setback from which he may never fully recover. The loss to the hog raiser is very great when the pigs become badly infested with the common round worms.

In order to prevent round worms the hog raiser should have some knowledge of the life history of the worm. The female worm will lay eggs in the intestines of the hog. These eggs are passed out of the body in the manure. The eggs are so small that they cannot be seen without the aid of a microscope. The eggs lie in the dirt and manure in the hog lots for some time—generally over winter. After the little pigs are born in the spring the eggs are in the right stage for hatching. The little pigs pick up these eggs in the hog lots when they nose around in the dirt or they may get them in the dirt on the sow while nursing. The eggs are swallowed and absorbed into the blood stream the same as the food. After passing thru the liver and heart the eggs lodge in the lungs where they hatch out into little worms about one-sixteenth of an inch long. After getting into the air spaces of the lungs the little worms are coughed up into the mouth and are again swallowed. This is the second time they have been in the intestines and they are now ready to grow. After they are full grown the males and females mate and then the female starts to lay eggs. One female may lay as high as eight million eggs.

The symptoms of worms are unthriftiness, stunted growth, weakness, "pot bellies," digestive disturbances and emaciation. Frequently worms are passed out in bowel discharges. While the worms are hatching out in the lungs they cause considerable coughing and in some cases pneumonia. Some of the worms may crawl up the bile duct into the gall bladder and shut off the action of the liver. It is not likely that all of the pigs will show these symptoms—only those that are badly infested. This condition need not be confused with hog cholera for worms are not a problem in old hogs while hog cholera affects hogs of any age.

The prevention of worms in pigs is entirely along sanitary lines. Any drug that is given to a hog by way of the mouth goes into the stomach and intestines and does not prevent worms from hatching in the lungs. It is useless to spend money for any medicine to prevent worms. The
only way to prevent worms is to break the life cycle or the life history of
the worm and the best way to do that is to prevent the pigs from getting
the worm eggs. A system of management that will provide a clean far­
rowing pen, a clean sow and a clean pasture for the sow and pigs will
go far toward preventing worms.

After a pig becomes wormy it is then necessary to give him a dose of
medicine to get rid of the worms. Oil of chenopodium (wormseed oil) is
the most efficient specific for worms. It is ordinarily given in a dose of
15 or 16 drops to a pig weighing 30 to 50 pounds. In order to get the
worms out of a pig the chenopodium is combined with a physic and castor
oil serves this purpose as well as anything. The dose for one pig is 16
drops of oil of chenopodium (1 c.c.) and 1 ounce of castor oil. A larger
dose of castor oil is sometimes given. The pig is kept off feed for 24
hours before the treatment. The dose is given with a syringe—com­
monly called a dose syringe. The syringe usually holds two ounces which
is enough for two pigs. The pig is held up on his hind legs by one man
while another inserts the nozzle of the syringe in the mouth of the pig
and gives the medicine. The pig is held a minute or so until he swallows.
The pigs should not be fed for 4 or 5 hours after treatment and should be
confined to a small place in order to observe results.

Rickets or Rachitis.

Boneforming elements are necessary for pigs at all times and especi­
ally when they are growing rapidly. These elements are mainly phos­
phorus and calcium. While the pigs are nursing they secure these elements
in the milk but the ordinary feeds do not contain a sufficient amount and
after weaning the pigs become paralyzed or weak in the back or hind-legs
as a result.

The direct cause of rickets is a lack of bone building material in the
feed. The common grains are high in flesh building material but low in
bone building elements. When sufficient bone forming salts are not sup­
plied the bones become soft, enlarged and easily broken.

The symptoms of rickets are manifested in several different ways.
Shortly after weaning when the pigs are growing fast they may become
lame, weak in the hind parts and even paralyzed. Some of the pigs may
develop enlarged joints and their legs may become more or less stiff.
When the affected pigs are moved they squeal from pain. The muscles
seem to be sore. Probably most of the pigs will get well if given proper
treatment. They seem to eat and drink considerable even though they do
not move around.

Another form of rickets which might be of interest to some hog raisers
occurs in sows. If a pregnant sow has been brought through the winter
on pretty much of a straight corn diet and little exercise she is a fit sub­
ject. When a bred sow is purchased this point should be considered. Young
sows that have big litters and are good milkers are especially susceptible.
It is one of the laws of nature that the bone building elements must be
supplied by the mother in the milk for the pigs. If none is being fed to
the sow, nature takes these elements from the bones of the sow and puts
them into the milk. This can only last a short time and then the sow will
break. She will become lame, paralyzed, and possibly die.

If the pigs are fed a reasonably balanced ration and are supplied with
sufficient lime, phosphorus, and salt there should be little difficulty with
rickets. However, it does occur once in awhile in fast growing pigs receiving the best of feed. If the feeding directions as given in this bulletin are properly carried out very few cases of rickets will develop. The mineral mixture given will help prevent rickets. Alfalfa pasture will help prevent it. Exercise and sunlight have a share in the prevention.

Pigs that are sick with rickets should be given plenty of milk. Lime water may be provided by putting a little air-slacked lime in the drinking water. Cod liver oil is effective and can be bought in the form of powder. The liquid cod liver oil can be mixed with the grain feed at the rate of 1 pound or 1 pint of the cod liver to 100 pounds of feed. Put the sick pigs or sow in a comfortable place and give a light diet with little or no corn. If the sow is affected the pigs should be weaned.

Hairless Pigs.

The losses from hairless pigs in South Dakota are not great but in some instances present a problem worth consideration. Hairless pigs are pigs that are born without hair and are generally farrowed too soon. Frequently a goitre or big neck is present in the pigs. In some cases the sow is affected with goitre.

Goitre is an enlargement of a gland in the neck and is caused by the lack of iodine. Sows affected with goitre may farrow hairless pigs.

Pigs that are farrowed too soon and are without hair are in most cases true hairless pigs. However, there are pigs farrowed too soon as a result of abortion. Also there are pigs born at the normal time without hair which are true hairless pigs. It is rather difficult for the raiser to make the distinction.

The true hairless pig production is very easily and simply controlled and should not be an important problem. If the pregnant sow received only a trace of iodine in her feed it is sufficient. If hairless pigs are a problem it is suggested that iodine in the form of potassium iodide be given. A mineral mixture made of equal parts of ground limestone, steamed bone meal and salt to make a hundred pounds is a very efficient mineral. To this may be added one-half ounce of potassium iodide. Dissolve the one-half ounce
of potassium iodide in a pint of water and sprinkle this over the 100 pounds of mineral mixture.

Mange. (Scabies)

Mange is a contagious skin disease causing the pigs to become unthrifty and lose flesh. The disease is very wide spread in South Dakota and is responsible for a great loss to the hog industry. There are two kinds of mange caused by two different mites but since the control is the same for both it will not be necessary to consider them separately.

Scabies or mange is caused by a mite. This mite spends its entire life on the hog. The mange mite is very small and can be seen after it has been magnified. A new generation develops every 10 or 12 days. One female may lay ten thousand eggs. The mite digs holes into the skin and covers itself with a crust.

A hog that is mangy may spend a large part of his time scratching. The mites set up an irritation to the skin. The condition is generally first noticed on the legs and then spreads to the sides and finally all over the hog. The skin develops little pimples about the size of a pin-head. Later the skin becomes thick and rough. Frequently the skin will crack open. The skin of the hog may look like the hide of an elephant and the disease is sometimes known as “elephant hide.”

Mange is spread only by contact—that is one hog rubbing against another or rubbing against the same post. These mites do not crawl any distance. If the mite is kept off the hog he will die in a short time. Therefore, if the hogs were kept out of a hog house for thirty days the house would again be safe as far as mange is concerned. The best way to kill a hog that is covered with oil he will soon die. The ideal method of controlling mange mite is to smother him. A mite breathes through his body pores and the mite breathes through his body pores.

The application of some heavy oil all over the hog at one time. It is necessary to repeat the application in ten days in order to kill the mites that have hatched out in the meantime as the oil does not destroy the eggs. The best oil to use is genuine crude oil—just as it comes from the oil well without any refining. Sometimes this is hard to obtain. Some results may be gotten by using crank case oil. Crank case oil may be improved by adding one pint of kerosene to each gallon but crank case oil cannot be expected to give the results of crude oil. Lime-sulphur dip is effective and generally easily obtained at any drugstore. The liquid lime-sulphur should be mixed according to directions on the container. If dry lime-sulphur is used it may be mixed at the rate of 32 pounds to 100 gallons of water or 1 pound to 3 gallons of water.

The application of either oil or lime-sulphur is considerable of a problem. If only a few pigs are to be treated the application may be made by hand. Catch the pig and hold him down while the oil is rubbed in with a brush. Be sure to cover the entire hog including the inside of the ears. If 15 or 20 pigs are to be treated, a few at a time may be put into a small pen and the treatment applied with a sprinkling can. The pen should be well bedded and the pigs held in the pen for two hours. Make a swab by wrapping a rag on the end of a stick and soak the swab in the oil, then lift up the ears and swab the inside. If a large number is to be treated a dipping tank will be the best. Partly fill the tank with water and then pour eight inches of oil on top of the water. If lime-sulphur dip is used the extra water should not be added and the straight solution of 32 pounds of
dry lime-sulphur to 100 gallons of water is used. A hog oiler will help to control mange if it is properly cared for. The worst thing to be said about a hog oiler is that it so seldom contains oil. Probably the roller type of hog oiler has some advantage over the shake down type. Whatever treatment is used it should be repeated in 10 days and at further intervals of 10 days if necessary.

Lice.

Lice occur frequently on hogs and cause considerable irritation. They obtain their food by puncturing holes in the skin. Such an irritation to the skin causes the animal to rub and scratch. When a hog is rubbing and scratching most of the time he is not taking on weight.

A hog louse is a blood-sucking parasite. The entire life of a louse is passed on the hog. The female glues the eggs to the hairs and the eggs hatch in 12 to 14 days. The average female will lay about 90 eggs. A favorite location for lice is inside the ears.

Hog lice spread in the same way as mange—by one hog rubbing against another or sleeping in the same nest. The control measures given in connection with mange are effective against lice. If lice only and not mange are to be controlled any ordinary coal tar dip such as Kreso will be effective. The solution is made according to directions on the container and the solution applied. This is repeated in 12 to 14 days. It is also advisable to soak the walls and floor of the hog house with this disinfectant to kill any stray lice. Do not expect a coal tar dip to control mange.

Necrotic Stomatitis. (Sore Mouths)

The sore mouths that occur in little pigs shortly after they are born is a form of "necro." The inflammation in the mouth interferes with nursing and the pig loses weight. The disease is especially common in unsanitary hog lots and where a large number of pigs are running together.

Little pigs have very sharp teeth and when they fight one another they bite openings in the lips and on the nose. These openings give the "necro" germ a chance to enter and set up an inflammation. The "necro" organism will kill the tissue and cause an abscess or an ulcer on the lips and in some cases on the tongue. Frequently the gums are affected. The ulcers are characterized by a yellowish, cheesy scab.

By cutting off the sharp teeth (not pulling) the number of openings for the infection to enter is greatly lessened. Avoiding too many pigs running together will help prevent fighting. Any pig so affected may be treated by painting the sores or ulcers with iodine. This may be applied with an old tooth brush.

Necrotic Rhinitis. (Bull nose or Snifflles)

"Bull nose" is a disease causing a lump or swelling to develop somewhere about the head of the pig, usually on top of the nose. It produces a distorted or enlarged nose, hence the term "bull nose." The same organism that causes sore mouths is responsible—in fact the disease is the same but of a different form. The germs enter through the skin or possibly through the nostrils and cause an abscess which in turn causes the swelling. Frequently an abscess will break and then leave a hole in the top of the nose. All abscesses do not occur on the nose but may be on the lower or other parts of the head.
After a pig becomes so affected treatment is of little avail. Bad cases should be destroyed. In some cases the abscess may be opened to let the cheesy material out and then treated with tincture of iodine. This might be followed by frequent dipping of the pig in some good coal tar dipping solution.

**Necrotic Enteritis.**

Necrotic enteritis is an inflammation of the lining of the intestines which causes the lining membrane to die and slough off. Under such conditions the pig cannot digest his food and will waste away and usually die. No other disease causes a greater loss in pigs. Compared with other diseases necrotic enteritis is new but it has spread very rapidly and become a very important problem to the hog raiser.

While there is some difference of opinion among authorities as to the primary cause of necrotic enteritis we cannot lose sight of the fact that the same old organism (necrophorus bacillus) is a factor. This germ is normally present in most hog lots that have been used for a number of years. It is an easy matter for pigs to pick up this infection coupled with other germs and inflammation of the intestines is started which ends in ulceration of the intestinal lining.

Pigs weighing from 40 to 60 pounds are especially susceptible to necrotic enteritis. After a pig weighs around 80 pounds he seems to have considerable immunity. The disease goes through the herd slowly and probably not all of the pigs will be affected. Some of the larger, more thrifty pigs never take the disease. The pigs affected seem to drink and eat considerable. Since the food is not digested or assimilated the disease is manifested by a profuse diarrhea. Sick pigs may live for several weeks and get well or die, depending on the severity of the disease. Old hogs are not usually affected.

More research work must be done before any specific treatment can be devised. Under present information about the only thing to offer is the use of internal antiseptics and some authorities claim that these are worthless. At least no harm is done by internal antiseptics in treating necrotic enteritis even though the value is questioned. Many good hogmen report that a weak solution of copper sulphate (bluestone) is helpful. Most veterinarians use some kind of an internal antiseptic in treating necrotic enteritis. In connection with the control of necrotic enteritis it is advisable to call a veterinarian because he can give much better treatment than any homemade treatment. The copper sulphate solution is made by dissolving one-fourth of a pound of copper sulphate in three gallons of water. This is a one per cent solution. A dose for one pig is a teaspoonful. If fifty pigs are to be treated a pint of the solution may be put in the slop or drinking water once a day. All sick pigs should be removed from the well pigs.

**Flu.**

Hog flu is nothing more than an infectious bronchitis and flu is not a good name for the disease. It is a herd disease and when it occurs it generally affects most of the herd. It is common in the fall of the year and is common on fair grounds. The direct cause is unknown but the lowering of the resistance of a hog by shipping or sudden changes in the weather is a factor.
Hog flu produces an extremely bad cough, a high fever, difficult breathing, loss of appetite and constipation. The disease may be complicated with pneumonia. The sick hog will lie around continuously and lose flesh rapidly. Most of the sick hogs will get well if properly cared for.

Treatment consists of putting the hogs in a warm comfortable place. Bed the hog house down with lots of straw. See that no drafts are present. Give some internal antiseptic like the one per cent copper sulphate solution in the drinking water. A very light slop or no feed at all for the first 24 hours and then only a light diet is advised. If the hogs are constipated a physic such as Epsom salts may be given. Under such treatment 90 per cent of the hogs will get well.

Abortion.

The premature birth of pigs is called abortion. This may be produced by several different conditions or it may be a contagious disease. Abortion may be caused by improper feeding or sudden changes in feeding. Exposure to extreme weather conditions might be a factor. Genuine abortion disease is caused by a germ.

This condition should not be confused with hairless pigs. Several sows in the herd may abort while probably only one sow would give birth to hairless pigs. The sow becomes restless and feverish. Bleeding from the genitals may occur. The pigs are dead when they are delivered. A discharge from the genitals will probably continue for several days. Proper care of the pregnant sows will cut down the amount of abortion. During pregnancy the sows should be fed properly and cared for as advised in this bulletin. If the abortion is a disease a veterinarian should be called for the proper treatment of the sick animals. It may be necessary to remove the afterbirth and wash the sow out with a weak solution of salt water. By all means separate the sick sow from the rest of the herd and use plenty of disinfectant solution in and around the pens.

Tuberculosis.

Tuberculosis is a slow-acting infectious disease caused by a germ and affects the glands, lungs, liver, spleen and other organs. Cattle, poultry and people have tuberculosis as well as hogs. Not many hogs die of tuberculosis because they are put on the market before they get to that stage.

The tuberculosis germ occurs in three forms—human, cattle or bovine, and bird or avian. Hogs will take either the cattle or poultry form of the disease. Hogs get these germs by following diseased cattle in the feed lot, drinking skimmilk from tuberculous cows or by eating dead chickens.

There is no way to describe the symptoms of tuberculosis in the early stages as no symptoms are present. In order to diagnose tuberculosis in a living hog it is necessary to perform a tuberculin test. In the last stages of the disease the hog becomes poor and thin. When hogs are slaughtered in the packing house it is a simple matter for inspectors to find tuberculosis if it is present. Therefore, very few people realize the extent of tuberculosis in hogs because they never see it.

Tuberculosis in hogs can be prevented by having all the cattle tested for tuberculosis and eliminating the diseased cattle. Milk that has been pasteurized or cooked is safe. Dead hens should not be fed to hogs and
Vaccination to prevent cholera is a good business practice.

neither should the chicken litter be put where hogs may come in contact with it.

**Hog Cholera.**

Of all the diseases among hogs, cholera is the most important. It causes a greater loss than any other disease. Millions of dollars are lost every year as a result of hog cholera. It is a contagious disease caused by
a germ and is characterized by a loss of appetite, fever, emaciation and death.

Hog cholera is a very old disease in this country. The first noticeable outbreak was in 1833 in the southwestern part of Ohio. It gradually spread to other states and at the present time very few states are free of this disease. The disease runs in cycles, that is, every few years it has a peak and then dies down for a few years.

The direct cause of hog cholera is a very small organism called a virus. This virus has certain characteristics. It is easily killed by sunlight. If kept away from sunlight in a cold, damp place it will live a year or more. It can be killed by disinfectants and by heat or fire. Therefore, it is important in connection with the control of hog cholera to let in plenty of sunlight, clean out the dark corners, use a lot of disinfectant solution and burn all dead hogs.

Anything that lowers the resistance of a hog makes him more susceptible to hog cholera. Young pigs are more susceptible than old hogs. The disease is more prevalent in summer than in winter. Improper feeding is a factor. If hogs are not properly housed they may lose their resistance. Pigs that are full of worms or covered with lice or mange lose their resistance to hog cholera. Proper feeding, care and management help to prevent hog cholera.

The symptoms of hog cholera are sometimes confusing because the disease does not always act the same. There are really three types of this disease. The first or very severe type kills the hog quickly. He has a high fever, refuses to eat, gets down within a few hours, probably has a few spasms and dies within 10 or 12 hours. This type is not common and is known as acute hog cholera. The hog comes up slowly behind the rest of the herd. He refuses to eat, drinks more water than usual and has a high fever. In a few days he gets thin and weak and has a wobbly gait. At first he is constipated and later has a diarrhea. He will probably live a week and then die. The third or chronic type is the mildest form of hog cholera. The symptoms are not much different than the second type except they are milder. Chronic hog cholera is common in the old hogs. An old sow may be sick a month, lose all her hair, a chunk of hide and then finally recover.

Treatment of hog cholera is entirely preventive. No cure exists. Hog cholera can be controlled by care and management, sanitation, quarantine and vaccination. The proper feeding of hogs to keep up their resistance is important. A hog should be fed clean feed and should not be expected to be a scavenger. A good comfortable house is necessary—one that is properly ventilated and drained. Plenty of clean drinking water should be supplied. All wallow holes should be eliminated. The hog houses should be cleaned and disinfected frequently. Under no circumstances should hogs be fed dead animals. A herd that is sick with cholera should be quarantined. There should be no contact between the neighboring farms. All dogs should be tied. No more exchange of labor should take place than is absolutely necessary. Vaccination, if properly carried out, will prevent hog cholera. The operation should be performed by a veterinarian. The hogs must be well at the time of vaccination. After vaccination the hogs should be put on a light diet. The best time to vaccinate is when the pigs weigh around 40 pounds. They are large enough so that a permanent immunity
may be produced, and they are small enough to be easily handled and in case a pig is lost the loss is not great. It does not cost as much to vaccinate a small pig as it does an older or larger hog. Vaccination should be considered a part of the cost of producing hogs and wherever there is any danger whatever of hog cholera the pigs should be vaccinated.

Importance of Records

Too much emphasis cannot be laid on the importance of keeping good records of the project. So often they are neglected only to be regretted by the boy when his club career nears its close and some very beneficial, free educational trips are just ahead. Accurate records prove which practices are the best to be followed in swine production and will show the value of the hog lot sanitation system, use of protein supplements, or some other practice.

Record books will be furnished every boy who joins a pig club. There is space for keeping a record of every factor which enters into the cost of production. Filling out the summary sheet tells the whole story of your year's work in a nutshell. What was the daily gain? How much grain did it take to produce 100 pounds of gain and how do the results compare with those of other members in the same club who have used different systems of feeding and management? What was the cost of a pound of gain? Has a net profit been made? Has the method of feeding been too expensive or the equipment too elaborate? These are questions which may be asked and the answers ought to be known. These results cannot be calculated accurately at the end of the year unless a good record has been kept thru the year.

When the project has enlarged to the point where five or six sows or even more are retained for breeding purposes, the herdsman is confronted with feeding and management problems which require the use of records. Shall oil meal be substituted for tankage? Will it pay to buy middlings for the suckling sows? Is a home made mineral mixture cheaper than a boughten one? Can the grain ration be limited on a group of growing pigs? Will it pay to buy some individual hog houses this spring? Accurate records are important in good management.

Looking at records from another angle, they are very important for improving the breeding herd. Pedigrees and records of performance are important in selecting breeding stock and the longer these records are kept the more valuable they become. By a system of marking a record can be kept of the best sucklers and mothers, good dispositions, economical and fast gainers, dams which are strongest transmitters of good type, matings of blood lines which give satisfactory results, size of litters produced, and many other important factors to which a breeder must give careful consideration in developing a successful herd. Work out a good system and keep it up to date.

Summer Care of the Brood Sow

The way the sow is handled in the summer depends upon two factors. First, if she is bred back for a fall litter, concentrates and protein feeds will be necessary to develop a good strong litter. Second, if the sow is
to be left open, only small amounts of concentrates are needed when good alfalfa, clover or rape pasture are provided. Shade and water are essential. All sows should be fed enough to maintain a thrifty condition. Young sows which have had their first litters and are suckled down thin should be supplied with enough of a balanced ration to bring them back into good breeding condition. If the young sows are not fed, they cannot be expected to develop into large brood sows.

A cheap and easy method of providing shade

Dry sows which are forced to make most of their living on good pasture and water during the summer should be flushed two or three weeks before the breeding season. Putting them on a well balanced ration brings about a good physical condition which may increase the size and strength of the litter.

Fall Litters

The raising of fall pigs in South Dakota is a profitable business if the grower has access to good equipment, shelter, proper feeds, and is willing to spend enough time to take proper care of the pigs. Due to the long, cold, hard winters in South Dakota the pigs demand a lot of attention. Good pasture and warm sunshine are not available for fall pigs except in the early part of their growth and they are big factors in the cheap production of pigs. Due to the above mentioned factors, the cost of gain will be higher for fall pigs in comparison to spring pigs but when grown for the market, the pigs will be ready to be sold in March, April and May when hog prices are on a relatively higher level due to smaller receipts on markets. For this reason fall pigs, if economically raised, are sometimes more profitable than spring pigs.

The South Dakota experiment station records show that practically the only difference in the feed requirement of spring pigs fattened for market in the summer and fall pigs fattened for market in the winter and early spring is in the amount of tankage required. The fall pigs have required about 1/3 more protein supplement than the spring pigs. The fall pigs have had a lower feed cost per 100 pounds gain than the spring pigs because the price of feeds is lower in the winter than in the spring. They have also found that the fall pigs take less work than the early spring pigs at farrowing time. This about equalizes the labor item. The housing required is about the same for early spring pigs as for fall
pigs. Fall pigs should not be housed too much or "coddled" too much for best results.

In South Dakota early farrowing is an important factor to consider. This means that sows which are raising two litters a year will have to farrow March litters in order to get them bred back in time for early September litters. September litters have the advantage of good fall pasture such as alfalfa, clover, rape and fall rye which means that they will be able to get a good start on clean pasture before cold weather sets in. Another method giving satisfactory results in South Dakota involves the practice of breeding fall gilts to farrow for early fall litters, gaining time enough to breed back for spring litters. Keeping the fall pigs free from round worms and necro is a big problem in economical hog production, thus the necessity of using the McLean County System. Access to dairy products such as skim milk and buttermilk is very desirable for the growing of fall pigs. Third or fourth cutting of alfalfa containing large quantities of leafy material, either fed in racks or on the ground, has proven to be a satisfactory substitute for part of the protein. Self-feeding of a balanced ration is a common practice for pushing fall pigs to an early marketable weight.

Housing is an important question and worthy of much consideration before breeding fall litters. The quarters must be kept warm, dry, well ventilated and comfortable during cold, wet weather. Individual houses for fall pigs have proven satisfactory at the South Dakota experiment station. It is very important to keep close watch for lice and mange. An ounce of prevention is worth a pound of cure. Lice and mange are difficult to handle in winter and all precautions should be taken for their prevention. Such parasites will prevent the making of mortgage lifters out of the pigs.

Preparing for Shows

Club members, especially those in the work for the first or second year do not always fully appreciate the value and importance of fitting
and showing for their local achievement day, county fair or state fair. If real interest, enthusiasm, eagerness to learn, and 4-H club spirit prevails on the part of club members, they cannot be kept away from the shows. The time it takes a boy to prepare for show is a minor factor in comparison to the educational value received which will help the member do a better piece of work the following year. It arouses interest and gives inspiration for higher goals. Boys learn to be good losers as well as good winners and are determined to come back fighting. Wide awake boys can pick up tips on successful hog breeding by sitting on a bale of straw about the pens listening to the conversation of experienced breeders. It is a cheap way of advertising and a good way to make valuable contacts with good livestock breeders who have been thru the mill. Even if you cannot win, show the results of your project, and club work will grow and help build the community.

The art of fitting for show is something that can hardly be perfected in less than one, two or even three years. Fitting covers a multitude of sins, so to speak, and must be started in time enough before the show to get the animals in shape. An animal should be brought to the peak of condition or full bloom to show best. Taking this into consideration, a sow suckling a litter cannot be fit for her best showing. Study premium lists and show classification standards so that pigs of the proper age will be selected for entry in different classes. Decide as early as possible which pigs out of the litter will be shown. Pigs with swirls, weak patterns, weak backs and poor type should not be considered as show prospects. Judges select the type of pig to head the classes that are to be maintained in the breeding herd. By studying records, it will be found that there is a correlation between show ring winners and production. If there is a difference in type within the litter which makes it difficult to select, take one of each type to the show and a competent judge can make the selection of the preferred type.

For show, pick a stylish pig that is active and moves well, one that

Curly hair is undesirable, indicating roughness

is well marked showing typical breed type and character, especially the head. A pig must be extremely smooth, uniform, well balanced, show quality and have all four legs squarely placed, stand up on the toes and have plenty of size and substance of bone. Pick a pig that is large and growthy for age or an appearance which would indicate that the pig
has even greater possibilities when grown out. A young pig that looks too mature does not go well in the show ring. If a pig is coarse or open in the shoulders, rough sided and heavy jowled, these defects cannot be covered up with the best feeding. Early farrowed pigs will have an advantage over the April and May pigs in the show ring because they are more mature and show off to a better advantage.

Do not get the impression that breeding hogs have to be extremely fat to show for such is not the case. Pigs which are not fully developed or matured should be kept in strong, healthy, full, smooth flesh. If matured, maintain them in full smooth flesh with good appetites. Boars and sows which have been over fat often will not breed and must be thinned by cutting down the feed and by exercise before they are ready to go to work again.

It should not be necessary to make a radical change in the feeding operations, especially in the younger stock that is being fit. If they are being fed on a well balanced ration of home grown feed of corn, ground oats, barley, wheat or rye, plus a protein supplement of tankage and oil meal and are on good pasture there should be little need of change other than possibly adding some shorts or middlings which are excellent fitting feeds. Feeding three times a day instead of twice with a little more attention is all that should be necessary.

Getting the pig in shape so that he can be shown to the judge in the best possible form will require some work and thought on the part of the showman. Get the pigs accustomed to being handled so that they will be under complete control while in the ring. The first impression the judge gains of a pig is usually the most lasting one and a pig which is hard to
handle or show may not be given justice in the placing. There are different methods used in showing hogs. Some showmen use a small whip which the hogs have been taught to respond to. Some use a cane which is very efficient to drive and guide with. Others use a light hurdle which can be used to good advantage in keeping pigs from fighting. A combination of any two may also be used. The main thing is to keep the pig looking his best at all times in a conspicuous place where the judge can see the animal when he wants to.

The pig should be washed once or twice before show in order to get the skin and hair in good physical condition. It may be necessary to do a little trimming of hair about the ears and tail to give the pig a neater appearance before show. Hogs should be clean and a light coat of oil such as mineral oil or linseed oil rubbed on their hair before going into the ring. It gives a glossier appearance to the animal thus presenting more attractiveness. Plenty of brushing always helps. Talcum powder is often used to whiten the appearance of Chester Whites.

Trimming the feet is something that is often overlooked in fitting the show herd. Pigs usually do not require much attention if they are taking plenty of exercise on pasture but older animals frequently need attention. Care must be taken not to trim off too much at a time to avoid sorefootedness and even lameness. The most common method used in trimming a pig’s foot is to throw him on his side and tie the legs together. A sharp knife and rasp can be used in doing the trimming. Start the trimming at the back and cut forward toward the toe. Trimming the feet, however, has a distinct advantage in that you can straighten the pigs up on their feet and strengthen the pasterns. This should be done in plenty of time before show so that they may walk freely and with ease.

Little courtesies to remember about showing hogs are—be able to answer questions concerning age promptly, keep the pig between you and the judge, do not overwork your animal, refrain from talking to the judge and forget about crabbing the placing if not satisfied. Good sportsmanship in the ring will win you many friends and above all be on time in getting your pigs into the ring.

Judging

Training in the judging of livestock is one of the more important features in club work. It should be every boy’s ambition to become a good judge. Judging is the weighing of the good and undesirable points of one animal against another and then balancing these points, having an ideal type in mind. Being able to judge competently will go a long way towards making a successful livestock man. It is a game which cannot be learned over night. Some men have spent a life time working with one breed and will admit they are learning every day. In going back through breed history we note that the men who have done the most constructive work in developing the breed were men who had the ability to select sires which would breed the type they were seeking. The young breeder just starting out will be doing buying and selling. Sound judgment is necessary in transacting good business deals.

Judging tours conducted under the guidance of a competent leader create a valuable opportunity for club boys to learn to recognize and analyze the value of an animal, both from a breed and market standpoint. Learning the fundamentals comes with the early training. The more tech-
Technical points will come through later experience. Good judges usually specialize in one or two breeds so boys should not become discouraged by expecting more of themselves than is possible. Attending good livestock shows affords a real opportunity to learn type, balance points and place livestock. Livestock breeders will be found about the ring side when the judging is going on. It must be kept in mind, however, that the best of livestock judges do not all see and balance their points alike and naturally they will not all place the animals alike. The boys who make mistakes in the beginning are the ones that usually get the most out of a class in judging because they will be watching for a similar situation the next time.

Could anything be more interesting than taking an active part in Achievement Day?

The first step in judging for a beginner is to familiarize himself with the various parts of an animal, their relative importance, and livestock terms which may be used to express and explain points. Some boys are good judges but cannot make a team because of the handicap of not being able to give reasons. A livestock breeder and judge must be a salesman so to speak. Convince the other fellow you are right by using sound livestock statements. Confidence in your own judgment and the ability and tact to sell other people on your judgment are qualities of a good judge.

Livestock judging is more than the measuring of a certain definite standard. It can be put as the combination of three distinct operations. For the beginner it is well to cultivate a mental image of the ideal animal for the breed, sex, and age under consideration. When a judge walks into the ring to place a class of 40 spring Poland China boars he must have a clear cut image of the ideal type or he is going to be like a man lost at sea. It does require knowledge of what the majority of the best breeders are looking for. To accomplish such a feat requires experience and artistic ability. There must be a true conception of the relationship existing between maturity and immaturity, especially in the judging of the
younger classes. That is why prize winners often do not repeat. They fail to grow out.

The second factor of importance is making a detailed study or observation of each individual. A judge who begins to compare the animals immediately is apt to become hopelessly lost. His mental image is blotted out and his powers of discrimination and judgment cannot function. The system of detailed observing will bring out all of the good and bad points which will help make decisions in close placings.

The third operation should be the balancing of points. This requires good thinking and tact to please the ringside. Boys often make the mistake of letting some minor point carry them wild in making their decisions. Experience and mistakes will remedy such weaknesses.

In judging a class of breeding hogs there are a number of defects or undesirable points that may be found which will help you draw a decision. Heavy, coarse, open shoulders are commonly overlooked defects. Get directly behind or in front of a hog to make this observation. If the shoulders are wider than the rest of the body and the width of the hog tapers backward, the shoulders are too coarse. Light hams are a serious defect. A ham may be cut up or lack plumpness. Others may be flabby and wrinkled. Firm, neat, plump hams are most desirable. A sow that has a heavy jowl and coarse, meaty head has anything but a breedy head. In nearly every case she lacks in character and femininity. One of the most common faults of a hog and at the same time a very undesirable defect overlooked by boys constantly is weak pasterns. A weak pastern means about the same thing as a disqualification in the show ring. If the pigs are walking down on their dewclaws or are lame, bottom is usually the place reserved for them unless there are similar defects in the same class. Short, shallow, rough sides are very undesirable in breeding stock. Weak backs and low behind the shoulders are serious defects which are easily noticed. The bacon comes from the side and a long, deep, uniform, smooth side is necessary to make a good side of bacon. Watch for pigs which are cut up in the flank. If tucked up in the rear flank the same will be true of the middle which is a point against the good, easy feeding kind. Short, stuffy, lowset animals are very undesirable and are easily detected. Curly hair usually denotes coarseness and lack of quality. Watch carefully for such coats. “Fish backs” are very undesirable. They are caused by the lack of width of loin and spring of rib which can be seen from an end view. After a pig is analyzed for defects, weigh any good points against the bad and consider the importance of the undesirable points the individual has. Are they general breed defects or something which can be easily remedied thru feeding?

The most important defects to look for in a fat barrow are different from the breeding class. Less emphasis is laid on feet and legs. They are of little value from a consumer’s standpoint. Heavy middles and jowls are serious defects because they lower the dressing percentage very materially. Avoid over done pigs as they are very undesirable. They are too fat, soft and sloppy and will not kill out a neat, firm, well marbled carcass. Unfinished pigs are also undesirable. They must carry a good degree of finish to kill well. Coarse, rough barrows never get much consideration from a judge. Other body conformation points are desirable in fat barrows as in breeding hogs, however, breed type and character are terms that should not be used in a fat barrow class.
In giving reasons on a class of animals, avoid the use of words such as "better," "I think," and "I guess." They are terms which do not mean anything and do not convince the judge that a true mental picture has been formed of the class. Too often a descriptive method of giving reasons is used instead of a comparative method.

**Marketing**

Careful thought and study should be given to marketing by every club member. Knowledge of marketing technic is constantly becoming a question of more importance and of greater interest to every hog raiser. Every member should be able to interpret market reports. This can be done by studying market terms and livestock grades. The principles of cooperative marketing should be understood by every member. Cooperative marketing hopes to raise the price of live hogs to the producer, but does not intend to raise the price of dressed pork to the consumer. For more than 20 years prior to 1920 hog producers received an average of 57 cents out of the consumer's pork dollar. Since 1920 they have received only an average of 40 cents. Cooperative marketing then, hopes to reflect a greater share of the consumer's dollar to the producer.

If the costs of production are high, profits cannot be made. Marketing calls attention to your cost of production, which you will find by referring to your record book.

Hog prices vary from month to month and from year to year depending upon supply and demand conditions. There is a direct relationship between the total number of pounds of pork slaughtered in any one year and the price the packers pay for it. This relationship should be studied. The variations in the month to month market supplies cause the seasonal fluctuations in prices. There is also a spread in price between grades of hogs, such as butchers, packing sows, stags and feeding pigs. We have cycles in hog production because farmers respond to price. They go into the business when prices are high and out again when they are low. Members should study this up and down movement in production and then along with this the outlook material that indicates where we are in the cycle and what farmers are likely to do. Production should be based on what the market is likely to be when you get ready to market your pig crop rather than on existing prices.

The time to market is also a question that needs careful study. Prices are usually the highest in June and September. This is due to small marketings during these months. South Dakota farmers market the majority of their hog crops in December and January when prices are the lowest. Late farrowed pigs are not ready for an early market. Where pigs come early they should be finished for the October and November market and thereby avoid the big winter run. Late farrowed pigs can be held over for the February and March markets. The high point in prices very seldom comes the same time two years in succession. Farmers figure on selling in the month the next year, that prices were the highest in the present year, so usually increased marketing at that time causes prices to drop. The high point in prices then the next year will usually either be a month before or after the high point in prices the present year.
Hogs are marketed at a wide range in weight but the weight for highest prices ranges between 180 and 240 pounds. The cost of raising pigs up to weaning time is greater than the cost of putting on the weight from when they are weaned until they weigh 200 pounds. After that gains are more costly.

If boars are to be sold in the fall they should have been farrowed early in order to get enough growth for early sales. Big growthy spring boars sell easier and for higher prices than late farrowed pigs. The early farrowed gilt also has an advantage in that she can be bred for an early March litter which is desirable if she is to be sold. Gilts that are bred for late litters usually sell at a discount.

The following government bulletins relate to marketing and can be secured from Washington free of charge:

"Farmers Build Their Marketing Machinery." Farm Board Bulletin No. 3.
"Marketing Classes and Grades of Livestock." Department Bulletin No. 1360.
"Marketing Classes and Grades of Dressed Veal and Calf Carcasses." Circular No. 103.

**Importance of Breed Papers**

Every club boy should take the breed publication which deals with the breed in which the club member is interested. Timely subject matter articles are written by competent breeders who have had years of experience. They serve to acquaint the young breeder with popular blood lines and prominent breeders thru the country. Different problems such as selection, breeding, feeding, care, housing, and showing are handled very efficiently and would serve as a real source of information to club members. Breed papers are a good means of getting acquainted with the breed and keeping up on new practices and developments.
Bulletins Available for Further Study

Farmers' Bulletin:
No. 781 Tuberculosis of Hogs.
No. 1244 Diseases, Ailments, and Abnormal Conditions of Swine.
No. 780 Castration of Young Pigs.
No. 1085 Hog Lice and Hog Mange.
No. 1455 Fitting, Showing and Judging Hogs.
No. 834 Hog Cholera.
No. 1490 Hog Lot Equipment.

Leaflet No. 5. The Prevention of Round Worms in Pigs.

The above may be obtained by writing to the United States Department of Agriculture, Division of Publication, Washington, D. C.

Extension Circulars obtainable from the Extension Division, State College, Brookings, are as follows:
Extension Circular No. 237, Hog Lice and Hog Mange.
Extension Circular, Necrobacillosis in Pigs.
Extension Circular No. 138, Farm Sanitation.

Books:
Feeds and Feeding by Henry and Morrison (Henry and Morrison Company, Madison, Wisconsin)
Pork Production by W. W. Smith.
The Hog Book by H. C. Dawson.
Types and Breeds of Farm Animals by C. S. Plumb (Ginn and Company, Boston, Massachusetts)
Extension Service
South Dakota State College of Agriculture and Mechanic Arts
Brookings, S. D.