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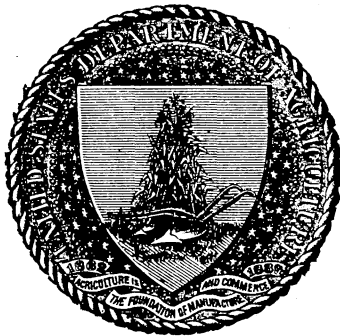
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# HOG RAISING IN THE SOUTH.

BY

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## LETTER OF TRANSMITTAL.

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U. S. DEPARTMENT OF AGRICULTURE,  
BUREAU OF ANIMAL INDUSTRY,  
*Washington, D. C., June 13, 1899.*

SIR: I have the honor to transmit herewith, and to recommend for publication as a farmers' bulletin, the manuscript of an article on Hog Raising in the South, prepared by Prof. S. M. Tracy, formerly Director of the Mississippi Agricultural Experiment Station. The bulletin contains much information in regard to the care, feeding, and breeding of hogs that will be valuable to stock raisers in the South and of interest to farmers generally.

Very respectfully,

D. E. SALMON, *Chief.*

Hon. JAMES WILSON,  
*Secretary.*

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# HOG RAISING IN THE SOUTH.

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## INTRODUCTION.

In the Southern States more pounds of pork are used than of all other meats combined. In a large proportion of the country homes beef and mutton are practically unknown, excepting occasionally in the winter months, and pork is almost the only meat food used by the large colored population. In every country store salt meat is as staple an article as is sugar or coffee; its cost is an important item of expense to the majority of housekeepers, and the demand for it seems limited only by the ability to purchase. Ten years ago fully 90 per cent of the pork used in the Gulf States was shipped from the great packing houses in Kansas City, Chicago, and Cincinnati, and little attention was given to its production here, few farmers growing even enough for their own consumption.

Since 1890, however, there has been a rapid increase in the number of hogs raised, a corresponding decrease in the amount of pork imported, and a still greater decrease in the living expenses of those who raise their own supply. Those who have engaged in raising hogs for the market have found it very profitable when rightly managed, and at the present time the business of raising hogs is increasing more rapidly than any other line of stock raising in the South. Conditions—climate, pastures, and grain feeds—are so different from those in the older hog-raising sections of the country that this bulletin has been prepared to describe some of the more economical methods peculiar to this region, as well as to give some general principles of breeding and management for those who have had but little experience in the work.

## GENERAL CONDITIONS.

The hog is often called the "mortgage lifter" of the great corn belt from Ohio to Kansas, but its power in this direction is by no means confined to the region of cheap corn. The Southern States can produce corn almost if not quite as cheaply as the most favored regions of Illinois or Missouri, while the much greater variety of food crops, the more nearly continuous grazing, and the consequent greater immunity from disease give special advantages for profitable pork raising which do not exist elsewhere. Profit from the raising of hogs depends more

on the supply of cheaply grown feed than on any other item. Food crops which are inexpensive to grow, which mature at different seasons, and which can be harvested by the hogs themselves are abundant in all parts of the South; and there is no reason why the Southern States should not be exporters instead of importers of meat.

#### LOCATION AND WATER SUPPLY.

For successful hog raising almost any location is suitable where there is a fertile soil on which food crops can be grown at a small expense and where an abundant supply of pure water can be secured. A good spring, or a small running stream which is not contaminated by drainage furnishes the best possible water supply. A large stream is undesirable, as it makes it difficult to keep the hogs fenced in, causes frequent losses by overflows, and often brings germs of disease from points nearer its source. The last objection is the strongest of all, as the germs of anthrax, cholera, swine plague, and other contagious diseases are often carried long distances by water, and such a possible source of infection should be carefully avoided. This spreading of disease by means of running water has been very plainly marked in nearly every outbreak of cholera in the hog-raising sections of the North, and though the disease is comparatively rare in the South, still it occurs occasionally, and its spread should be prevented by the use of every available means.

Shallow, stagnant ponds, in which the hogs are allowed to wallow, are equally undesirable and should never be tolerated. It is true that such ponds are in very common use and that many fine hogs are raised with no other water supply; but it is also true that such pools are always disease-spreading centers and are often responsible for serious losses which are attributed to cholera. No animal can be healthy or produce meat of the best quality when compelled to drink the putrid offal with which such ponds are always poisoned. Where a pond is the only available source for the water supply, it should be fenced so that neither cattle nor hogs can reach it, and the water should be drawn off into an outside trough as it is wanted. It is a small matter to provide for this when a dam is built by having a 1-inch galvanized-iron pipe laid through the bottom of the dam. The end of the pipe in the pond should be protected by a large strainer, and the outlet provided with an automatic float valve so that the trough will always be kept full, no water will be wasted, and a fresh supply will be drawn in as fast as the trough is emptied. The whole arrangement can be made at an expense of not exceeding \$5, the value of a single half-grown hog, and will often save many times its cost in a single season.

It is not necessary that hogs should be provided with a place for wallowing in mud, as they will seldom wallow except when suffering from heat. A hog does not perspire freely, and so feels the effects of heat very quickly. When the only means for protection from the hot sun is

to bury himself in mud, he will naturally do so. In the shade of a building he often misses the breeze, but in the shade of trees he will always be contented. An abundant supply of water and protection from the hot sun are both necessary, but should never be combined. With shade and good water provided, the other details of the location are of minor importance.

#### BUILDINGS AND FEED LOTS.

Elaborate and costly buildings are not needed, and, in fact, should be avoided. In the South it is rarely necessary to protect from cold, and all that is needed in the way of a building is something to furnish shelter from rain and a dry place in which the hogs can eat and sleep. Ordinarily a shed 8 by 10 feet, open on the south side, is all that will be wanted. This shed need not be more than 3 feet high at the back and 6 feet at the front, and should be floored. If the arrangement of other buildings is such that it is more convenient to feed from the south side, then that side should be closed by slats sufficient to control the hogs, but not close enough to shut out the sun and air, and at least one-half of the north side should be left open. In all cases the floor should be given a slope of at least 2 inches to the side opposite the feed trough to prevent the accumulation of filth. Such a shelter is ample for at least a dozen hogs, and when more are kept it is better to have additional separate shelters than to attempt keeping a larger drove in a single large building. Hogs always do better in small droves than when many are kept in one inclosure. Rough planks are all that is needed for the floor, as its main object is to prevent the hogs from making a dirt floor into a dust bed, which, next to impure water, is the most prolific cause of disease.

At the rear of each house there should be a yard large enough to give ample room for exercise, and if there is a number of these yards they should be arranged so that they can be thrown together and the hogs easily changed from one to another when desired. Whatever may be the arrangement of the yards, they should be surrounded by a fence so well made that it will offer no temptation to the most knowing animal. A hog which has never broken through a fence will seldom attempt to get out of his lot and will give very little trouble, but if he is permitted to break out a few times he will know that a fresh pasture and a change of feed are just on the other side of the fence, and will soon learn to go where he pleases.

#### BREEDS AND BREEDING.

The choice among different breeds is more a matter of personal preference on the part of the hog raiser than of real superiority in any one breed of hogs. Each has its peculiarities, its excellences, and its defects, and it can not be said that any one of them is always more



profitable than another. Management and feed are more important than breed, and the choice should be decided by the treatment to be given.

#### SELECTION OF A BREED.

The more common breeds in this country are the Berkshires, Poland-Chinas, Chester-Whites, and Duroc-Jerseys, though Essexes, Suffolks, and a few others are occasionally seen. Thirty years ago the differences between different breeds were very marked, but with the greater attention which breeders have given to the production of animals possessing an ideal form the characteristics of the different breeds have approached each other, until now nearly all breeds have the same general form. Value in a hog of any breed is measured by his ability to make good pork, and experience has shown that, ordinarily, good pork can be produced more cheaply in a hog of a certain shape than in one which differs from the type to any great extent.

**The Perfect Hog.**—The outline of a perfect hog, when viewed from any direction, should be nearly that of a parallelogram with the corners slightly rounded. His back and belly, also his sides, should be straight and parallel; and, when viewed from front or rear, his outline should be nearly square, but a little deeper than wide. The head should be short; the face straight or somewhat dished and wide between the eyes; the ears should not be too large, should be thin, soft, and joined to the head by a small knuck. A large, coarse ear usually indicates a coarse animal which will fatten slowly. The jowl should be full, well rounded at the sides, and making a straight line from the tip of the lower jaw to the point of the breastbone. The neck should be short (the shorter the better), but well rounded, arched, and increasing in size from the head to the shoulders. The shoulders should be full and square, with the legs set well apart so as to afford ample room for the lungs and heart, and the heart girth just behind the shoulders should be nearly equal to the girth at any other point. The back should be broad and straight, and should be slightly arched rather than swayed between the shoulders and hams. The ribs should be well sprung to make the back broad, and should drop nearly straight at the sides. The belly should be wide and straight, not flabby nor drawn in at the flanks. The hams should be as wide as the shoulders, nearly flat across the top, and drooping but little to the root of the tail; they should be well rounded behind and come well down on the stifle, so as to make the lower part of the ham full and plump. The legs should be short, straight, set well apart, and strong enough so that the animal, even when well grown, will walk wholly on his feet and not upon his hocks and dew claws. The bristles should be fine, soft, and sufficiently thick to hide the skin. Coarse, stiff, erect bristles indicate a coarse animal which will mature late and unsatisfactorily, while if they are so few and short as to show the skin plainly they indicate a weak constitution and consequent liability to disease. Color has but little to do with the

value of an animal, though there is a general prejudice in favor of black hogs for a warm climate. Buyers seldom make any difference in price on account of color, though there is usually a special demand for a few fancy white hogs about Christmas; but the scalding and scraping must be very carefully done or the skin will be reddened and so injure the sale in the local market. Packers pay no attention to color. The disposition of the hog should also be considered. An animal which is always uneasy, which is continually trying to escape from the lot, and which is inclined to fight and worry others, is too nervous to be a good feeder; on the other hand, a hog with too much of the opposite character, one which is rarely on his feet except while eating the food brought to him, will fail to make a satisfactory growth on pasture and will not take enough exercise for health. A medium between these extremes is a much better feeder than either.

**The Berkshires.**—The Berkshire is one of the oldest breeds, and one of the most popular in all parts of the South. Berkshires are of English origin, and were first brought to this country about 1830. They may be put in good condition for killing before they are six months old, but will continue to gain in weight until they are two years or more of age. They are good “rustlers” and will make a large part of their living in the pasture, but respond quickly to fattening food. They lose less in dressing than do most others, though a slightly greater proportion of their dressed weight consists of fat, which is better for making lard than for use on the table. The sows are very prolific and good mothers.

**The Poland-Chinas.**—The Poland-Chinas are the more popular breed in the corn belt of the North, and are about as numerous as the Berkshires in the South. They are a composite breed of recent origin which seems to have been developed naturally by the conditions existing in a region where corn forms almost the entire food. They originated in Ohio from miscellaneous crosses of the Big China, Irish Grazier, Poland, Byfield, and perhaps other stocks. The name of Poland-China was given about 1840 to a large, coarse black and white hog requiring about two years to mature, but growing to an enormous size, animals weighing 600 to 800 pounds not being uncommon. Crossing of these with Berkshires gave a smaller, finer, smoother, and earlier-maturing animal, closely approaching the Berkshire in form and color but still retaining a great part of its power of continuous growth up to three or four years of age, and dressing out a carcass nearly all of which is merchantable meat. While not as good grazers as the Berkshires, nor as well able to take care of themselves when turned into the woods, the Poland-Chinas of the present day have a quiet disposition, are easily controlled, grow rapidly, and fatten quickly. They appear to bear close confinement rather better than the Berkshires, and so are often preferred for pen raising. Usually the sows are not quite so prolific as the Berkshires, though some strains are very fertile breeders.

**The Duroc-Jerseys.**—The Duroc-Jerseys are large, long-bodied, red hogs, which are good feeders, easily fattened, and grow very rapidly when well fed. They have come into prominence during the last fifteen years, being descendants of the Jersey Red and the Duroc breeds, which have long been popular in Pennsylvania, New Jersey, and New York. The blending of the two has produced an animal which is easily kept or fattened, is small-boned, vigorous, and prolific. Being very long-bodied, the proportion of side meat to ham and shoulders is larger than in most other breeds, but many regard this as an advantage, and the breed is growing in favor wherever it has been introduced.

**The Chester-Whites.**—These are undoubtedly the most popular of the white breeds. They take their name from Chester County, Pa., where they originated by crossing the native white hogs with some large white hogs brought from England about 1825. Selection from the offspring of those crosses has made a great improvement on the form of the earlier animals, and has developed a hog quite similar to the Poland-China in shape, and differing from that breed but little excepting in color. Where any white hog is to be grown this is the best for general purposes. •

**The Essex.**—This is a small black hog, of English origin, and is valued more for its quiet disposition, rapid growth when young, and early maturity than for its size or its ability to produce a large amount of meat. Where there is a local demand for well-matured hogs of small or medium size, or for pigs of which one or two are to be kept in a small pen and fed principally on slops from the house and the refuse from the garden, the Essex is a valuable animal, but is not generally popular for ordinary farm purposes, or for making large amounts of pork under ordinary conditions.

**Other Breeds.**—The small Yorkshires, Suffolks, Victorias, and perhaps other breeds are seen occasionally, but probably nine-tenths of the pure-bred hogs now in the South are either Berkshires or Poland-Chinas. The small breeds—Essex, Suffolk, and others—have never been popular in the South, as they reach a weight of 200 pounds little sooner than do animals of the larger breeds, while the latter, if allowed to live, will continue to gain in weight long after the others have ceased to grow.

As showing that there is practically very little difference in the meat-producing capacities of different breeds, Professor Henry, of the Wisconsin Experiment Station,<sup>1</sup> reports a test extending through two hundred and twenty-four days with a Berkshire boar and four sows, together with a similar lot of Poland-Chinas. The total gains and the amount of feed required for each 100 pounds of gain were as follows:

	Berkshires.	Poland-Chinas.
Total gain of lot.....	<i>Pounds.</i> 1,167	<i>Pounds.</i> 1,168
Feed for 100 pounds of gain.....	512	524

<sup>1</sup> Henry: Feeds and Feeding, p. 551.

The Poland-Chinas gained 1 pound more than the Berkshires and ate 12 pounds more grain for each 100 pounds of gain, but these differences are so slight that they can not be ascribed to the difference in breed, being more probably due to the individualities of the animals used. Many similar tests have been made at other experiment stations, but with no uniformity in results either in actual gains or in the amounts of feed required; hence it is safe to conclude that differences in breeds are more in form, disposition, and habits than in food requirements.

#### PURE-BLOODS, CROSSES, AND GRADES.

Whether it is most profitable to raise pure-bloods, crosses, or grades is a matter which is much discussed, but which can not be definitely settled in favor of either class for all cases.

**Pure-bloods.**—In general, good pure-blood animals of any preferred breed will be found more profitable than either crosses or grades, though a poor specimen of a pure-blood animal is no better than any other poor animal. The fact that an animal has a long pedigree and is registered in a herdbook does not in itself make the animal desirable as a breeder or profitable as a feeder. A desirable breeding animal must not only have the prepotency developed by generations of breeding to a certain definite standard, but must also have the form and characters of that standard in a sufficient degree so that it is itself a good specimen of the breed. Hogs are used for nothing except for the making of pork. The pure-bloods have been bred for many generations for that sole purpose. The best animals—those which had the ability to make a pound of meat from the least food in the shortest time—in each generation have been selected as breeders, while inferior ones have been rejected. In this way the natural tendency of the pure-blood animals of to-day has become so fixed by generations of selection that they make a rapid growth from a small amount of food. The “scrub,” on the other hand, has been bred for the development of an animal which would, to a large extent, care for itself, while quick growth, good form, and easy fattening have been neglected, and the animal is to-day but little different from his wild ancestor. It has been literally “root, hog, or die,” and the rooting form has been developed at the expense of the hams and side meat. When given an equal amount of food, the pure-blood will weigh fully twice as much as the native hog at six months or more, and when slaughtered will lose only 20 to 25 per cent of its live weight, while the native will not ordinarily dress more than two-thirds of its live weight. As the pure-blood will make more meat from the same amount of food and in less time than the scrub, it is the better animal.

**Crosses.**—It is a very prevalent idea that crosses make better animals than pure-bloods. It is argued that as Berkshires and Poland-Chinas are each good, a cross will possess the special good qualities of both, and so will be better than either. The crossing of two pure-blood animals of different breeds often gives pigs which are fine animals, have

good forms, and will mature quickly and satisfactorily. When a litter of pigs is to be raised exclusively for slaughter, such crossing is not objectionable, and many careful hog raisers think it the better practice; but the pigs from such crosses, however good they may be, are of little value as breeders. The pure-blood ancestors on both sides have been developed toward certain definite but different ideals. In the first cross there seems to be a blending of the two types, and the results are often very satisfactory, but the offspring of these crosses are almost sure to show all the weaknesses and defects of both lines of ancestors as well as many of their own. Breeding from crosses, even though the individual animals may be of good quality, is rarely satisfactory or profitable.

**Grades.**—Good grades are much more reliable breeders than are crosses and are to be preferred. The native stock has the vigor of constitution, which is always necessary, and has no inherited prepotency to develop in any certain direction. When mated with a pure-blood, the result is usually an animal with the vigor of the native ancestor and the characteristics of the pure-blood parent shown in its better form and fattening qualities. Succeeding crosses in the same direction strengthen this tendency toward improvement. The great objection to “grading up” in this way is the fact that, no matter how fine specimens the animals may be, they can never be sold as pure-bloods, and an animal which is a grade will never sell for breeding at as high a price as will one which is of pure blood and entitled to registration. The man who intends to follow hog raising as a business, even if he does not keep more than a dozen animals, will find it both profitable and economical to buy a pair of pure-bloods, and then make his entire drove pure-bloods as soon as he can raise enough desirable animals. By buying a young boar and a sow already in pig by a boar not related to the one purchased, the boar can be used on the offspring of the pure-blood sow as well as upon the grades or natives in the herd, and in this way the pure-bloods can be increased so rapidly that there will soon be no need to keep the grades. The hog raiser should certainly use a pure-blood boar, and it will usually pay to buy a new one each year, so that inbreeding may be avoided. Pure-blood hogs are not necessarily expensive. They pay best in the end, and so are more profitable than either crosses or grades. Good animals, though not the best, of any of the standard breeds can be purchased for from \$5 to \$10 each when weaned, while young sows in pig can be bought for from \$10 to \$20. Of course older animals which show specially fine qualities will cost more, and their better qualities will often make them the more profitable in the end. Breeders who have established reputations as producers of exceptionally fine animals usually receive much higher prices than those named above, but often a man who raises hogs for production of pork only, and who does not care for a reputation as a breeder, will sell good breeding animals for little more than their pork value.

**THE BOAR AND HIS TREATMENT.**

Hogs intended for breeding should be selected from the very best in the drove. No one can afford to raise pigs from animals which refuse to fatten, which are frequently "off their feed," or which have in any way shown anything but the most vigorous health. The breeders should be the squarest built and best shaped animals in the lot. They should be hearty eaters, and should show a tendency to lay on fat rapidly.

Blood tells in hogs as well as in horses, and to save a sow for a breeder simply because she is not fat enough to kill when the others in the same lot are ready for market is one of the surest ways to secure inferior pigs.

It is usually better to buy a boar than to use one which has been raised on the place and is related to the sows which are to be bred, as the introduction of fresh blood will give larger litters and more vigorous pigs than can be expected from any close inbreeding. This is one of the principal reasons why the first crosses between different breeds are usually so satisfactory, and the offspring of such crosses, when bred among themselves, are so unsatisfactory. The breeding sows can usually be selected from those in the drove, but a new boar should be purchased as often as the sows have passed their prime and are replaced by the offspring of the old boar. If hogs are grown for the market only, it is not necessary to pay a fancy price for a fancy animal which has every bristle of just the right color and pointing in exactly the right direction. The man who is raising hogs to be sold as pure bred breeding animals can not be too careful to purchase only such as come nearest the ideal shape, color, and style typical of the breed he is using; but for the man who is raising pork and who does not expect to sell fancy breeding animals, slight variations in color, shape and position of ears, and length of tail are of little importance. What the pork raiser should require in his boar is good form and size without coarseness, good feeding capacity, and a strong constitution. A short neck and short legs usually indicate good fattening qualities, and so are important requisites; they are even more important in the boar than in the sow. The boar should be small-boned for his size, but it is all important that his frame should have sufficient strength to carry him well on his feet.

Among the points to be avoided in choosing a boar are a long head, neck, and legs, as such a form indicates an animal which will require a large amount of feed to produce a pound of meat, and one which can not be finished off for market until he has reached considerable age. Walking partially on the dew claws shows weakness of frame, and indicates a poor grazer and an animal which will break down before he reaches a heavy weight. In a young boar the shoulders should not be broader than the hams. The back should not be swayed, nor too strongly arched, though a back which is moderately arched is much less objectionable than one which is swayed.

In breeding for pork the boar need not have all the finer markings of his breed. Color of hair on the hog makes no difference with the quality of the pork, but he should have a good form, and should be descended from animals having good forms. A poor specimen of a pure-blood animal is little better than a scrub, and should not be used simply because he has a long pedigree. Pedigree is good because it gives prepotency, but form and vigor are better because they give pork. Good shape is absolutely necessary in a good boar, and if he has a good pedigree also he is a much better animal.

Nearly all breeders of fancy stock have numerous boar pigs which are not quite up to the standard in some unimportant particulars, and so can not be sold as strictly first-class animals. The defects may be nothing more than a slight variation in color, swirls in the bristles, or a missing tail; but with even such defects the animals would stand a poor chance in the show ring, and breeders are often glad to sell them for little more than their value for pork. Such animals are just as good as any where pork and not show is wanted, and will insure much better pigs than can be expected from an equally well-formed grade or an inferior pure-blood.

The man who is raising hogs to be sold for breeders can not be too careful to use only such as come nearest the ideal for the breed; hence, from his point of view, defect in color, swirls, or a missing tail would be a serious blemish to the animal. The breeder of breeding animals can well afford to pay a relatively high price for an animal which is free from these minor defects, as his sales will depend largely on the general appearance of his herd, while the hogs of the pork raiser are sold by the scales.

Boars should not be purchased until they are four or five months old, as they do not show their form fully before that time. They cost less at weaning time, but their purchase at that time is a lottery, as a promising pig often develops into an inferior and poorly shaped animal. It is not safe to delay the purchase until the boar is wanted for service, as others will be wanting him at the same time, and there may be delay in finding a desirable animal. The service is more sure and the boar can be handled with much less trouble if he has been on the place for a few weeks before he is needed for use. He should have time to become accustomed to his new quarters before he goes to service.

The boar should never be allowed to run with the sows, as he will be a continual worry both to them and to his owner, and it is much better to keep him in a lot where he can neither see nor hear other hogs. He should be kept as quiet as possible, and his food should be such as will give him strength and vitality, but not too fattening. He will do better service when he has sufficient grazing to give him exercise and only sufficient grain food to keep him in good condition without becoming so fat as to be heavy and unwieldy.

### THE BREEDING SOW AND HER MANAGEMENT.

The sows for breeding can usually be selected from the drove. As "like produces like," they should always be selected from large litters from sows which are good milkers and good mothers. The gilts selected should be good feeders and have the prospect of becoming good milkers. A sow which is not a good feeder will produce only small litters, will be a poor milker, and her pigs will never make the quick and even growth necessary for good profits. It is impossible to judge accurately of the milking qualities in a gilt, but usually a chunky, easily fattened, heavy-boned, and short-legged sow is not as good a milker as is the less attractive-looking one with a longer body, longer legs, and somewhat less rounded sides. Form should not be wholly sacrificed to the production of large litters and abundant milk, but good milking capacity is essential to a good sow. If the pigs are not able to get all the milk they need during the first six weeks of their lives, they become stunted in a way from which they never fully recover, and many pigs which die before they learn to eat solid food die of starvation. A sow which is a good milker is usually a prolific and careful mother also.

Many defects of form in the breeding sow may, to a great extent, be corrected in her offspring by mating her with a boar which is unusually strong where she is weak. If the sow is too long-headed, long-necked, and long-bodied, she should be mated with a boar having the opposite characteristics; if the sow has weak legs and her dew claws touch the ground the boar should have unusually strong and straight legs; if the sow is sway-backed the boar should have his back well arched. On the other hand, a boar which has weak points can often be used with success on a sow which is unusually strong where the boar is defective, though a weakness in the boar is not counterbalanced as readily as one in the sow, on account of his greater prepotency. A boar and sow having the same defects should never be mated, as similar defects are almost certain to be greatly exaggerated in the pigs.

It should be remembered that the boar gives half the blood to the whole herd, while the sow can influence only her own litter. For this reason it is highly important that, whatever the sows may be, the boar should be one which will give vigorous pigs of good form. As nearly all the breeding sows in the drove at any one time will be the offspring of a single boar, and so will have a strong resemblance to each other, it will not be difficult to select a new boar which will be a fairly good mate for all.

**Age at Which to Breed.**—No uniform rule exists in regard to the age at which a sow should be bred the first time, as more depends on the maturity of the animal than on the number of months it has lived. In the South it is usually more profitable to raise two litters yearly, having them come about April and October. Where this is practiced, sows raised on the place must be bred when they are either 8 or 14 months of age, and the younger age is usually the better. A pig which has been



properly cared for will weigh over 200 pounds at that age, and is sufficiently matured to produce a fair number of vigorous pigs. If not bred until 14 months old she may have one or two more pigs in her first litter, but even that is uncertain, and during her six months of waiting she will have earned nothing. A sow which has her second litter at 18 months will usually have more pigs than one which farrows then for the first time, and during the previous six months will have raised a number of pigs, which will be worth much more than the cost of her keep.

**Young Sows and Old.**—The number of litters which a sow should be allowed to have before she is fattened for butchering depends on the animal herself. When a young sow has only four or five pigs, or shows herself to be a poor milker or a careless and indifferent mother, the sooner she is fattened the better; but if she does fairly well she should be given a second trial. The second litter is usually larger than the first. If she then proves a good mother and her pigs from both litters develop into good porkers, she should be kept as a breeder until she can be replaced by a more prolific and better animal. An old sow which regularly raises large litters of good pigs is worth half a dozen untried gilts. An aged sow mated with a young boar will produce pigs which will mature earlier than those produced when the sow is young and the boar aged, which is a strong argument in favor of keeping a sow as long as she continues to breed satisfactorily. Ordinarily sows cease to be profitable breeders after they are 4 or 5 years old, but some raise good litters after they reach 8 or 9 years. When a sow more than 4 years old fails to give a good litter whenever it is due, she may as well be fattened at once.

**One Litter or Two.**—Whether it will be better to have one litter or two each year is a matter which each hog raiser must decide according to his own conveniences. When comfortable shelter is provided and good winter pastures can be secured, October pigs are usually as profitable as those which are farrowed in the spring. By the time they are ready to wean, oats and vetch should be in good condition for grazing, and the young pigs will soon begin to eat artichokes so they need not be confined to dry feed. By spring they will be large enough to kill for a local market, or they can be kept growing through the summer with very little expense. By December they should weigh at least 300 pounds each, and be ready for market. In every town there are butchers who are always watching for opportunities to buy pigs weighing from 100 to 200 pounds for the local trade, and October pigs will often bring high prices for meeting that demand.

March or April pigs come at a season when they need little care, and can be carried through the summer at a very small cost. By December, if they have been well fed, they will weigh from 250 to 300 pounds each, and at eight months will be fully as profitable as the heavier October pigs, which have been kept fourteen months.

When only one litter is raised yearly it should come as early as March, and often February is the better month.

**CARE OF BREEDING SOWS AND PIGS.**

During the four months the sow is carrying her pigs she needs good care, as she not only requires support for herself, but must have such an abundance of nourishing food as will enable her to produce healthy and well-developed pigs. During the first two months no change need be made in her usual food, and she can be left with the rest of the drove without danger, but as her time for farrowing approaches she should have somewhat different treatment. She should be kept in a separate lot from the fattening animals, as she will need different feed, though several pregnant sows can be kept in a lot together without danger. From this time onward her food should be such as will produce bone and muscle rather than fat, but she should never be allowed to become thin in flesh. Bran, shorts, shipstuff, ground oats, and pease should constitute the principal part of the grain feed, and but little corn should be used. Fresh green feed is especially needed at this time, and if grazing is not convenient, green feed should be cut and fed liberally.

A week or ten days before farrowing she should be put in a pen by herself so that she will have time to become accustomed to her new quarters before the pigs appear. The farrowing pen need not be large, 10 feet square is ample, but it should be where she will not be disturbed by other animals. The pen should have a floor, and running around the sides a 12-inch plank should be fastened 6 or 8 inches above the floor to afford the pigs a safe place where the sow cannot crush or smother them. It takes the pigs only a day or two to learn the value of this protection, and it will often save much more than its cost. Little or no bedding should be used. The feed at this time should be strengthening but not heating, and if any indication of costiveness appear she should have a good feed of wheat bran. A constant supply of salt and ashes is specially needed at this time to satisfy the craving for such food which often makes sows eat their young. Eating her young pigs is an unnatural act on the part of the sow, and is almost invariably the fault of the feeder in not giving her the food needed to satisfy a natural appetite.

When the sow is about to farrow, from one hundred and twelve to one hundred and sixteen days from the date of service, she should be given only light feeding, but should have all the water she wants. If she has had proper feed and treatment she will rarely need assistance in farrowing, but the owner should be at hand, watch her closely, and be ready to give help if needed. If it is very cold the pigs should be taken away as fast as they are born and put in a warm basket, but should be returned to the sow as soon as she is through. It is true that many sows which run in the woods and are never looked after before farrowing will make nests in fence corners or behind logs and come up with fine litters of thrifty pigs, but it is also true that a still larger number of those which run at large crush or smother many of their

young and lose others from various accidents which might easily be prevented. If young pigs are worth breeding they are worth caring for, and when the farrowing is properly looked after the losses will be very small.

After farrowing the sow should be given nothing but water or a little thin slop during the first twenty-four hours, and should be fed only lightly for several days. After the end of the first week her food should be increased as rapidly as is safe, and should consist of shorts, oats, and similar foods which will stimulate a flow of milk. The feeding of the sow during the first month after farrowing is of more importance than at any other time, as the vigor of the pigs depends on the amount of milk they receive from their dam. If the supply is too small, they are stunted so that they can never make the most profitable feeders, while if the supply of milk is too large, the pigs are almost sure to become affected with scours and receive a setback from which they are slow in recovering. It needs close watching and good judgment to give the sow just the right amount of food to keep both her and her pigs in the best condition. The amount of grain should be increased with the growth of the pigs, and green feed should be given liberally. A good start is necessary to the most rapid growth of the pig, and as the young pig must make its entire growth on food received through the mother it is poor economy to save feed on the sow at the expense of the future of her entire litter. After the first week there is less danger that the sow will be fed too much than that she will not be fed enough. If she should be overfed and the pigs show any indication of scouring, she should have less feed and be given strong lime water to drink. If the pigs are old enough to drink, they should be given scalded milk in which a little wheat flour has been mixed, and an egg stirred in with the milk for each two pigs will be beneficial. If the pigs are too young to drink they should be given four or five drops of paregoric.

#### RAISING THE PIGS.

The pigs will begin to eat when they are about three weeks old, and the more they can be induced to eat the more rapid will be their growth. A feeding place should be provided for them adjoining the pen in which the sow is kept, and so arranged that the pigs can go in and out at will without being disturbed by the sow. A few grains of soaked corn scattered over the floor will soon get the pigs in the habit of eating and they should be encouraged to eat as much as possible. As dry corn will hurt the teeth and make the mouth sore, shorts or oats should be given in the place of soaked corn as soon as the pigs learn to eat fairly well. When the pigs begin to drink they should be given all the skim milk they want if it can be had, and if it is not available they should have a thin slop made of water and shorts. Corn meal is too fattening and is poor feed for young pigs.

By the time the litter is three weeks old both the sow and pigs should have the run of a lot where they can get sunshine, exercise, and fresh grazing, though the pigs should still have the feeding place where the

sow can not come and should be fed regularly with all they will eat of food which will give them bone and muscle but will not be too fattening. Shorts, ground oats, and pease are the best grain feeds, and skim milk is worth more to a pig during the months before and after weaning than at any other time. Corn and rice are of little value for making growth. Bran is so harsh that it often causes irritation of the bowels, and is not a safe feed for a pig under three months old. Good grazing will make the larger part of the growth, but the pigs need grain feed also to make them do their best.

With such grazing as will be afforded by oats, vetch, and artichokes during the winter, and by alfalfa, clover, melilotus, and other crops in the spring, together with skim milk and such grain feed as has been named, the pigs will be well able to feed themselves by the time they are eight weeks old, and neither they nor the sow will hardly know when they are weaned. Pigs which have never been encouraged to eat, and are largely dependent on their mother's milk for food often receive a severe check when they are weaned suddenly, and every day in which a pig does not grow adds that much to the expense of raising him. By giving the pigs all the solid food they will eat while still sucking they become accustomed to it gradually, and when the time comes to separate them from the sow at about the end of the eighth week they are so well prepared that they scarcely notice the change.

If the sow has been well fed while suckling the pigs she will have made a fair gain in weight during the last month, and after the pigs are weaned she should be given more fattening food to prepare her for raising another litter, or as the beginning of her fattening for market. When a sow has an abundance of good grazing, and not more than half her grain feed is corn, she will not become too fat for breeding. In fact a sow is rarely too fat for breeding, although there is a common prejudice to the contrary. So long as she continues in good health and is making a fair growth her fatness will not make her less prolific, and she will usually produce larger litters and stronger pigs than when thin. This is especially true of young sows, and with such feed as has been recommended no sow will become too fat before weaning her second litter. The sow will usually come in heat in from one to two weeks after her pigs are weaned, and, if she is to be bred again, should be served at the first opportunity.

The pigs should be pushed as rapidly as possible after weaning, for the sooner they can be made to weigh 200 pounds each the more profitable they will be. Good pastures and good water are necessary for health and making a satisfactory growth, but in addition to these the pigs should have a liberal supply of bone and muscle-making food. Shorts, ground pease, peanuts, and other feeds rich in protein, together with skim milk when possible, are the best feeds for growth, and an exclusive corn diet is the poorest. Pigs will fatten rapidly when fed on corn alone, but the fattening will be at the expense of health and growth, and there will be many deaths from apoplexy before the pigs are six months old.

### CASTRATING AND SPAYING.

Young boars not wanted for breeding should be castrated as early as is convenient. This may be done at any time after the pigs are a month old, and if done at from four to six weeks they will have fully recovered before they are weaned. If not done then it is better to wait until a month after weaning, so that they will have become thoroughly accustomed to eating solid food.

Spaying young sows is no more difficult or dangerous than castrating young boars, and should be more generally practiced. It can be done best when they are between 3 and 4 months of age, and, as the young sows are liable to get with pig at any time after they are 4 months old, the spaying should not be delayed too long. By the time the pigs weigh from 75 to 100 pounds each they will be developed sufficiently to show which should be kept for breeding animals, and the sooner the others are spayed the better. Spayed animals are always more quiet and better feeders than open sows, make better pork, and sell for better prices. A spayed sow weighing 200 pounds will dress from 10 to 20 pounds heavier than an open sow of the same live weight; she will have heavier leaf and inside lard, and there will be no danger of loss from finding her in pig. Packers and butchers will always pay top prices for spayed sows, because such animals are sure to be as good as they look, while they will often refuse to purchase open sows at any price, or will take them only with a heavy allowance for shrinkage.

### FOODS AND FEEDING.

The economical and profitable production of pork requires that the feed should be palatable, nutritious, and inexpensive. No one kind of feed can be used exclusively with profit for feeding pigs, breeding animals, and fattening hogs, and no one feed will continue to be as palatable as a variety of feeds. It should be the object of every hog raiser to induce his animals to eat as much as possible, and the greater the variety the greater will be the amount of feed consumed. The cheapest and most profitable feed is that which can be grown with little labor and harvested by the hogs themselves, though it is economy to supplement each grazing crop with grain and other feeds suited to the condition of the animals.

### PERMANENT PASTURE.

Hog raising can seldom be made profitable without a good permanent pasture, where the hogs can secure a large part of their coarser food at a nominal cost, and where they can have the exercise which is absolutely necessary to good health. If the hogs have an extended range, as in woods and canebreaks, they will make fully half their growth without further cost, and when such a range is not available pasture should be provided. There is no other grazing plant which will give

so much hog food per acre through a large part of the year as alfalfa, and on soils where it can be grown it will pay well to provide the hogs with such a pasture. The soil for alfalfa should be sandy rather than heavy clay, and the subsoil must be well drained or the plants will be short lived. Good alfalfa soils are found in all parts of the South along the rivers and larger streams, on the marl hills, in the rotten limestone regions, and in the sandy hill lands of the middle district. The man who has land suitable for an alfalfa pasture need have no trouble in making pork profitably. Where alfalfa can not be grown Bermuda grass, lespedeza, and melilotus are excellent substitutes. The hog is naturally an animal which feeds over a wide range, and, although the food which he gets from the native pastures or even from alfalfa will not alone enable him to make the rapid increase desirable, still it is essential to health and will form a good part of the bone and muscle needed for satisfactory growth. A good pasture is as necessary for profitable hog raising as for the growing of beef animals, and no one should attempt to grow pork for market without providing at least one field where the hogs can have abundant exercise and can find enough roots and herbage to keep them in health.

#### ANNUAL FORAGE CROPS.

While a permanent pasture is essential, temporary grazing crops will do much toward reducing the cost of making pork. There are a number of easily grown crops which furnish not only coarse forage, but also a large part of the grain feed which will be needed, and a selection can be made which will give a succession lasting nearly or quite through the year in a region where the ground is so rarely frozen. Oats and vetch, sorghum, corn, sweet potatoes, cowpeas, peanuts, and artichokes all make excellent feed, can be grown with little expense, and in nearly all localities will make fields which can be grazed with profit from January to December. Other crops, like crimson clover, chufas, and cassava, have been found very profitable in some localities, while the gleanings of the corn and other fields always gives a good amount of inexpensive meat. It is always well to grow a variety of these grazing crops rather than to have a larger acreage of only one or two, as the greater variety not only gives a better succession of growths, each of which is grazed when in its prime, but gives better results in meat produced per acre.

Hogs are wasteful grazers when turned into rank pasturage, and a great saving of feed can be secured by growing the different grazing crops in long, narrow fields, which can be divided into sections by movable transverse fences. Usually there will be no trouble in arranging the fields so that this may be done, while, by maintaining a succession of plantings, and by fencing the hogs away from such recently grazed crops as oats, sorghum, and others which will make a second growth, the fields need not be large. By frequent changes of the feeding ground, 1 acre will yield abundant grazing for at least ten full grown

hogs, or for a correspondingly larger number of younger animals and pigs.

**Artichokes.**—For winter and early spring there is no better crop than artichokes, which give a rich, fresh feed just at the time when grasses and clovers are at their poorest. There are few crops which can be more easily grown on any fairly good soil which will give a greater amount of green feed per acre and be more valuable for both growing and fattening animals. They should be planted in drills like Irish potatoes, the seed being cut in the same manner, and about the same amount being used per acre. Two cultivations will usually be sufficient to keep the ground mellow and free from weeds until the plants are so tall as to shade the ground, after which no further working is needed. The tubers do not form until late in the season, and in this latitude are rarely matured before the 1st of December. Even then they are not relished as well as they are later, and as they keep well in the ground until late in the spring, it is usually better to save them for January and February grazing, after the sweet potatoes, peanuts, and other crops are gone. Although the artichokes will make a volunteer growth from the scattering tubers left in the ground, such a crop can not be cultivated, and will be so choked by weeds and dwarfed by the hard ground that the yield will be small. It pays well to plow and replant the crop each season, even though it is planted on the same ground. Many object to artichokes for fear they will become a troublesome weed, but there is no danger from that source. If the young plants are plowed or even hoed off well in midsummer after the old tubers are exhausted and before the new ones are formed, they will be killed. The yield is variable—from 400 to 800 bushels per acre—and its feeding value is fully equal to that of other root crops. In some recent tests at the Oregon Station hogs which were given the run of an artichoke field, and were also given a partial feed of grain, made a gain of 1 pound in weight for each 3.1 pounds of grain fed, while it usually takes about 5 pounds of grain to make 1 pound of gain. In tests made at the Missouri Agricultural College 1 bushel of artichokes and 3 bushels of corn were found superior to 4 bushels of corn, and other tests have given similar results. The inexpensive gain in weight is not the only advantage in using artichokes, as the better health consequent on adding to the ration this fresh and succulent feed is a matter of great importance, especially in animals which are kept for breeding. The best soil for the crop is similar to that which is best for Irish potatoes. It should be rich, mellow, and well drained. On dry, hard clay the yield is always small.

**Oats and Vetch.**—A mixture of turf oats and hairy vetch, sown in October or November, makes an excellent grazing crop for use after the artichokes are gone. When sown on fairly good corn ground this crop will have made such a rank growth by February that it will furnish good grazing during the next two or three months. The turf oats bear

grazing better than does rye or barley, are less easily injured by freezing, and will continue their fresh growth much later in the spring. It is undoubtedly the best grain crop we have for grazing. The vetch also makes a vigorous growth, and, pound for pound, gives a feed richer in protein or muscle-forming material than any other common pasture plant.<sup>1</sup> Its unusually large proportion of protein makes it specially valuable for young and growing animals, and it gives the very best of early grazing for fall pigs which are to be kept through the summer. When the oats begin to head and the vetch to flower, in April, stock should be taken off, so as to allow the plants to mature seed, which they will do late in May or early in June. The ground should then be plowed and planted in cowpeas or some other summer crop which can be cut for hay or grazed off in September and October, after which the vetch seed left in the ground, and usually the oats also, will make a volunteer growth fully as good as that of the previous season. The writer has used this rotation six years without replanting the vetch and there has been an almost constant increase in the yield. In some seasons the volunteer oats have failed to make a full stand, but the vetch has never failed to make a satisfactory growth. One bushel of the oats and 1 peck of vetch seed are sufficient to seed an acre. The soil should be a rich loam which is not too light. The vetch has not often been satisfactory on sandy soils, but recent experiments at the Alabama Station<sup>2</sup> show that by proper inoculation such soils will produce abundant yields. By the time the hogs are removed from the oats and vetch the permanent pastures will be in fine condition and will give good grazing for many weeks. This will be especially true where alfalfa, melilotus, and clovers are grown, and at this time but little grain need be fed. During the early summer months growth of bone and muscle are more important than the accumulation of fat, and, although it pays to feed a little grain at all times, the amount used during the early summer may safely be less than at any other season.

**Sorghum and Kafir Corn.**—Sorghum and Kafir corn are the best crops for early summer grazing, and by a succession of plantings will continue to furnish feed until late in the season or until killed by frost. The two crops are very similar and require the same treatment, sorghum being of the quicker growth and making the better summer food, while Kafir corn will make the better growth in the dry weather of early fall, and its heavier yield of seed, which matures just as the fattening period begins, makes it very valuable. The sorghum should be sowed broadcast at the rate of one bushel per acre as soon as there is no further danger from frosts, and will make fair grazing in four or five weeks. As it is killed by too close grazing or by rooting, the field should be grazed in sections. If the field is arranged for temporary cross fences, as suggested on a previous page, it is better to keep the hogs on each

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<sup>1</sup> Experiment Station Record, Vol. VI., p. 98.

<sup>2</sup> Bulletin No. 96, Alabama Experiment Station.



section only a week and then give the plants three weeks to recuperate and make a new growth. When treated in that way a small field may be grazed down two or three times, and a single planting will furnish feed at least two months, while later plantings treated in the same manner will still further prolong the season. Kafir corn may be planted at the same time as sorghum, but, as its greatest value is for grazing in late summer and early fall and for its seed, it is usually planted much later, and should be planted in drills, so it can be cultivated. The stalks are less sweet and so less valuable than those of sorghum, but it makes a greater weight of leaves per acre, and its yield of seed is fully one-half greater than that of sorghum. Being such a drought-resistant plant and producing such a heavy yield of seed (from 30 to 50 bushels per acre), it is often grown mainly for its seed, while its forage value is regarded as a secondary matter. In one test at the Kansas Experiment Station 100 bushels of Kafir corn seed was found to equal 83.7 bushels of corn for fattening hogs; in another test at the same station 100 bushels of Kafir corn seed equaled 84.8 bushels of corn; while in a third trial, with pigs soon after weaning, 100 bushels of the seed equaled 90.4 bushels of corn. At that station the average yields per acre for nine years had been 45.9 bushels of Kafir corn seed and 34.2 bushels of corn; or if expressed in pork, the yields have been 454 pounds of pork per acre from Kafir corn and 402 pounds from corn. In many places in the South the difference would be still more marked in favor of Kafir corn, as it will grow and yield much better than corn on thin clay hills, which are specially subject to injury from drought. Where the southern hog-raiser has rich, moist bottom lands on which to grow corn and forage, Kafir corn has no marked advantage over sorghum, corn, and other crops.

**Cowpeas.**—Cowpeas give rich grazing from July until October, and should always be grown for use during late summer and early fall. Being very rich in protein, they make an excellent food for growing animals, though not desirable as the exclusive feed in the final fattening, as the fat meat produced by them is too soft and oily to be of the highest value. Lots for early use may be sown on the ground from which artichokes were harvested, and will be ready for use in two months from planting. For later use some of the quick-growing sorts may be planted on the vetch ground, or, if the ranker-growing and later-maturing sorts are sown on the artichoke ground or elsewhere, they will make an immense growth of forage for use in September and October. Usually, however, it is better to sow the peas for late grazing in the cornfield than to use land for that purpose alone. With the earlier-ripening varieties of peas and sorghum the hogs will be carried up to the beginning of cool weather without trouble.

**Sweet Potatoes.**—For September, October, and November the best three crops are sweet potatoes, peanuts, and chufas, and as the soil

becomes more sandy they become of more importance. All grow well in soils which are quite light and sandy, while none of them is worth planting on heavy soils. Sweet potatoes make the best root crop which can be grown for fall use in the greater part of the South, being less expensive to cultivate, yielding more heavily, and being richer feed than beets, turnips, or rutabagas. In some sections of Florida, and along the Gulf coast, cassava is often a better crop, but with that exception the sweet potato is unexcelled for all soils which are not too wet and heavy. They can be planted at any time from May to July, and will be in condition for grazing from the 1st of August until late in November, or during the months when ordinary pastures are dry, and such succulent food is worth more than at any other time. In grazing, the hogs will waste and destroy a large portion of the crop if allowed free range, and the field should be divided so that only a small part of it will be added to the feed lot at any one time.

**Peanuts.**—Peanuts are very rich in protein, and so are especially valuable for animals which are growing. Their yield in bushels is less than that of sweet potatoes, but their feeding value per bushel is much greater; and, as they are rich in muscle-forming materials while sweet potatoes have their chief value as fat-producers, the two supplement each other. The best variety for grazing is the Spanish, which yields fully as well as others, and its compact growth makes it easier to cultivate. On soils of medium fertility and with ordinary care a yield of from 50 to 75 bushels per acre may reasonably be expected, and as the hogs do the harvesting the expense of making the crop is much less than for securing an equal amount of food from most other crops. Some recent work at the Alabama Experiment Station shows<sup>1</sup> the high feeding value of peanuts in a very striking manner. Six pigs, with a total weight of 184.3 pounds, were used in the test, which lasted six weeks. The peanuts were grown on about one-sixth of an acre, and during the test 373 pounds, or a little more than 6½ bushels of corn, were fed. At the close of the feeding the pigs had more than doubled in weight, having made a gain of 196.4 pounds. Valuing the corn at 40 cents per bushel and the pork at 3 cents per pound, the peanuts, when harvested by the hogs, were worth \$18.34 per acre. The expense of cultivating the peanuts was much less than for cultivating an equal area in cotton, and the thin, sandy soil on which the nuts were grown would not have made more than 200 pounds of lint per acre, while the yield of peanuts was 62.6 bushels per acre. In another test at the same station, peanuts alone, peanuts and corn meal, and corn meal alone, were fed to determine their relative pork-producing value. At the close of the sixth week it was found that 2.8 pounds of peanuts alone, or 3.7 pounds of equal weights of peanuts and corn meal had been consumed for each pound of gain, while 10.7 pounds of corn meal alone had been needed to make the same growth. On butchering the

<sup>1</sup> Bulletin No. 93, Alabama Experiment Station.

hogs used in the tests it was found that the peanuts had greatly softened the pork and lowered the melting point of the lard, and that this was not wholly corrected even when the hogs were fed on corn exclusively for a month before slaughtering. Like other feeds rich in protein, peanuts are more valuable for growing animals than for those intended for immediate killing. The Bulletin says further: "It is highly desirable to arrange a succession of peanut crops rather than to have large areas ripen at the same time, for in wet weather Spanish peanuts will not remain long in the ground after maturity without sprouting."

**Chufas.**—Chufas grow well only on soils which are somewhat sandy, and will make good yields on soils which are too light for any other root crops, and so are specially valuable for soils where the yield of other crops is too small for profit. Like artichokes, they can remain in the ground uninjured through the winter, and so may be used for grazing at any time from November to February. From the fact that the tops of the plants, which are small and grass-like, do not cover the ground sufficiently to prevent the growth of weeds, the crop needs a longer time of cultivation than do sweet potatoes or peanuts, but the yield is large, often from 100 to 150 bushels per acre, and its season for use is so long that the small additional labor required in cultivation is not out of proportion to the value of the crop. At the Louisiana Station<sup>1</sup> they "were a splendid success, suggesting and proving themselves to be a splendid crop for hogs." At the Alabama Station<sup>2</sup> the yield was 172 bushels of green nuts per acre, the amount shrinking to 115.24 bushels when dried. The feeding tests which have been made with chufas show that while seldom profitable as an exclusive feed, they have great value as a fresh and succulent feed for use with corn and other grain.

**Cassava.**—Cassava is a plant which, from the limited tests it has received, promises to be an extremely valuable forage plant for Florida and for the immediate coast region westward to Texas. The valuable part of the plant is the thickened and starchy roots, which grow from 1 to 3 feet in length and from 2 to 3 inches in diameter. Each plant produces a cluster of these roots, and single clusters weighing from 15 to 20 pounds are not uncommon. Under ordinary field conditions the yield is from 5 to 8 tons per acre, though much heavier yields are often reported. The plants are propagated by cuttings of the stems and branches, which are buried and kept through the winter like sugar cane. Although the plant will survive a mild winter when left in the ground, annual plantings are more profitable. According to analyses made by the Department of Agriculture,<sup>3</sup> the roots contain a much smaller proportion of water than is found in other roots used for feeding, and so are correspondingly richer in food elements which belong

<sup>1</sup> Bulletin No. 27, Louisiana Experiment Station.

<sup>2</sup> Bulletin No. 16, Alabama Experiment Station.

<sup>3</sup> Bulletin No. 44, Division of Chemistry.

principally to the fat-forming group, 89.84 per cent of the dry material being carbonaceous while only 2.59 per cent is protein. Such a food is far more valuable for fattening than for growing animals, but it can be produced at such a low cost that some of the more expensive nitrogenous foods—shorts, peanuts, or cowpeas—can be used with it and so form a good growing ration at a low cost. When hogs have reached nearly their full growth, and it is desired to add fat for finishing off it is claimed that cassava is the cheapest food known. In tests at the Florida Station<sup>1</sup> the increase in weight in hogs fed seventy-five days cost only 1.04 cents per pound from cassava, while the cost of corn-fed meat was 3.06 cents per pound. In this estimate cassava is reckoned at \$6 per ton, the price paid for it at the starch factories, though the actual cost of growing it was less than \$2 per ton. Similar results have been secured at the Louisiana Station, and for the extreme southern section of the country, where the climate gives at least eight months free from frost, pork can doubtless be produced at less cost from cassava than from any other one plant.

**Crimson Clover.**—Crimson clover makes good winter grazing along the South Atlantic coast and in some sections of Florida, but has not been generally satisfactory west of Georgia. Occasionally it makes a heavy growth as far west as Louisiana, but has usually been less valuable than the vetch, which matures at the same season. In sections where it grows its grazing value is about equal to that of the vetch; but very few localities have been found where both succeed, though one of the two can be made to grow on nearly all soils, and the one which succeeds best should be grown by every hog raiser for winter and early spring grazing.

**Succession and Rotation.**—With such a large variety of plants, some of which will furnish grazing at all times, it is not difficult to make a selection for any locality which will give continuous pasturage through the entire year, and which will furnish fully one-half the food for the hog at an almost nominal cost. By arranging a proper rotation much of the ground can be made to produce two crops annually, and as all will be consumed in the field succeeding crops can be grown without the use of fertilizers. The best succession of crops for different soils and localities must vary greatly, and the kinds grown on the hog lots will also be varied by those grown on the other parts of the farm. The size and shape of the lots will be varied by the location of the buildings, the ground available, and the location of the fields. While no one plan can be universally adopted, the following may be used on a great variety of soils and can be easily changed to suit the surroundings:

A field 20 rods in width and 40 rods in length is divided into five sections, each 4 rods in width and containing 1 acre. Shade should be provided by planting mulberry trees along the division fences. Beginning in April, lot No. 1 is planted with sorghum, to be followed by turf oats and vetch in October; No. 2 is planted in sweet potatoes, also to

<sup>1</sup> Bulletin No. 49, Florida Experiment Station.

be followed by oats and vetch; No. 3 is planted in peanuts; No. 4 is planted in sweet potatoes in June or July for a late crop; and No. 5 is planted in artichokes. The following year lot No. 1, which was in oats and vetch through the winter, is planted in sweet potatoes, to be followed by oats and vetch in the fall; No. 2, also covered with oats and vetch through the winter, is planted in artichokes; No. 3 is planted in sorghum or Kafir corn, to be followed by oats and vetch in October; No. 4 is planted in peanuts, and No. 5 in sweet potatoes, both to be followed by oats and vetch.

In the case of some of these crops, as the sorghum and sweet potatoes, it is often better to plant the end nearer the buildings a few weeks before the farther end is planted, so that the entire crop will not mature at the same time. When the lots are planted in this manner, and temporary cross fences are used, so that the hogs have only a few rods of fresh grazing each week, such a 5-acre field will furnish good and constant grazing for from 25 to 50 hogs, together with the pigs which would naturally belong with such a drove. Of course the succession and varieties named may be changed almost indefinitely, and for many localities should be changed. In some sections crimson clover should be substituted for vetch, and on the light, sandy soils in the extreme southern section cavassa should take the place of artichokes. Chufas will sometimes be better than artichokes, and, when the hogs are to have fall grazing in a cornfield which has been planted with cowpeas, the peanuts may be omitted and some other crop increased. In arranging any such rotation the important point is to select crops which will give an uninterrupted succession, and the most abundant grazing at times when but little is to be had from other parts of the farm. It should be remembered that the meat which the hogs make by grazing is the least expensive, and it is poor economy not to make as much of it as is possible.

#### GRAIN AND OTHER FEEDS.

A certain amount of grain feed is needed to grow hogs with the greatest profit, and still more is needed to fatten and fit them for market, but it should be used only to supplement the feeds which the hogs harvest for themselves in the field. Pork can not be made economically when all, or even a larger proportion, of the feed comes from the crib or the mill. The hog is an omnivorous animal and needs "roughage" and fresh green feed for his best health and growth and to produce meat of the best quality. When young his grain feed should be such as will furnish material for bone and muscle, and not such as will produce an excess of fat; while, as the animal approaches maturity, fat-producing foods should be given more liberally. No one kind of grain feed can be used economically from weaning until the full-grown animal is slaughtered, and there should be a gradual change from the nitrogenous, muscle-making food given to the pig to the carbonaceous, fat-making food, which is more profitable for the last few weeks before

**killing.** The young animal must have good bone and muscle before it can carry the heavy load of fat desirable for the butcher or develop the strength, vigor, and health necessary in a good breeding animal.

**Corn.**—Corn has always been the staple grain food for hogs and is the best and cheapest for “finishing off” to make the animals ready for butchering. It makes the meat very firm, gives it a fine flavor, and makes a better lard than can be obtained from any other food. It is strictly a fattening food, however, and is not the best grain for young animals or for breeding stock. When young animals have an abundant range with a good supply of nitrogenous foods like alfalfa, clover, vetches, and cowpeas, corn makes a valuable addition to the ration, but should not be given in excess, and will usually be found more profitable if mixed with shorts, bran, or some other feed containing a larger proportion of protein. For the last few weeks before slaughtering, corn alone is often the most economical grain food. Little advantage will be secured by grinding it before feeding. Numerous tests have been made, by the experiment stations and by other feeders, in comparing whole corn with corn meal, and although the results have usually been in favor of the meal by from 4 to 8 per cent, that difference will barely pay the cost of grinding. Corn meal or soaked corn can sometimes be used to advantage in feeding young pigs, but under ordinary circumstances it is fully as profitable to feed the corn dry and whole.

**Shorts and Bran.**—Shorts and bran are among the best feeds for growing animals, and when they can be had for \$20 or less per ton will always be more profitable than corn for young stock. For young pigs bran is not so good as shorts, as it often has an irritating effect on the bowels, and when fed too liberally causes scours and other troubles from which the animal is slow in recovering. Shorts, when fed in reasonable amounts, seldom causes such troubles and is usually the best and cheapest grain feed for use during the first three or four months. As the animal grows older bran may be used more freely.

Cowpeas may be used in the place of shorts or bran, but as they require grinding their economical use is confined to the feeding of young animals, and the crop can commonly be used more profitably in other ways.

Rice bran and rice polish are cheap grain foods in the rice districts, but their feeding value is not equal to that of corn meal. They consist almost wholly of starch, and so are better for fattening than for growing stock.

**Cotton Seed.**—Cotton seed has been used in almost every form for feeding hogs, but never with success when the feeding has been continued any length of time. It has been fed raw, roasted, steamed and boiled; and the meal, both raw and cooked, has also been tried in various ways, but almost always with the same result—the death of from one-fourth to one-half the drove within twelve weeks from the time the feeding began. Apparently the hogs do well the first few weeks after the feeding begins, but at about the sixth week occasional

deaths occur, and the losses continue from that time onward. The hogs show no indication of sickness and make very satisfactory gains until within two or three days or sometimes within a few hours of death, and no curative treatment seems to have any effect. Nearly every experiment station in the Southern States has endeavored to find some combination of feeds, of which cotton seed should be a part, which could be fed with safety, but without success, and it seems useless to make any further attempt to use it as a hog feed. Before it had any commercial value cotton seed was often thrown into shallow ponds, where it soon became half rotted, and, when in that condition, hogs often ate it with impunity, but with the present market value of the seed more than double the amount of food can be secured by exchanging it for corn or shorts.

**Skim Milk.**—Skim milk should always be used when it is available. It is not only a good flesh producer in itself, but it also makes the ordinary grain feeds more digestible and so adds greatly to their value. While skim milk alone is rarely profitable, from 20 to 40 pounds being required to make a pound of meat, when mixed with grain in the proportion of 3 pounds or less of milk to each pound of grain its value is greatly increased. In a test reported by C. P. Goodrich<sup>1</sup> 1 bushel of corn produced 10 pounds of pork, and 100 pounds of skim milk produced 5 pounds of pork, when fed separately. When fed together, however, the mixture produced 18 pounds of meat, an increase of 3 pounds due to the mixing. In this case 100 pounds of skim milk took the place of 44.8 pounds of corn. If the corn was worth 25 cents per bushel, the milk was worth 19.6 cents per 100 pounds; if the corn was worth 40 cents, the milk was worth 31.4 cents. Extended tests in the feeding of skim milk have been made at the Utah Station,<sup>2</sup> and among the facts brought out by the work are these: "The hogs fed on the milk-and-grain ration made much more rapid gains than either those fed on milk alone or on grain alone. The time required to make 100 pounds of gain was seventy-nine days for the hogs fed on milk and grain, one hundred and sixteen days for those fed on grain alone, and one hundred and forty-seven days when the feed was milk alone. The milk-and-grain-fed lots required 2.58 pounds of digestible matter, the milk-fed lots 2.85 pounds, and the grain-fed lots 3.19 pounds to make 1 pound of gain in live weight." In this case 100 pounds of skim milk took the place of 23.2 pounds of grain in the mixture. Work at other stations has given very similar results and has demonstrated that when not more than 4 pounds of skim milk is used with each pound of grain the milk is worth from 15 to 30 cents per 100 pounds. The younger and smaller the hogs the higher is the value of the milk. For full-grown and aged animals it is of less value. It may be taken as a safe rule that it is profitable to pay at least 15 cents per 100 pounds for all the skim milk needed to make four times the weight of the grain fed,

<sup>1</sup> Pork production, p, 91.

<sup>2</sup> Bulletin 57, Utah Experiment Station.

and where it is impossible to secure enough for all the hogs the available supply should be given to those pigs nearest the weaning age and to sows suckling pigs.

**Salt and Ashes.**—One item of feed which should never be neglected is a good supply of salt and ashes to which the hogs can have access at all times. Wood ashes can always be had and the hogs should have all they will eat. When not convenient to give ashes, charcoal is a good substitute, and even soft coal will be eaten for want of something better. Hogs are never injured by eating all the ashes they want, but it is not safe to give large amounts of salt to animals not accustomed to its use. The salt and ashes mixture should be kept in a low box under a shed where it will be protected from rain, and should consist of about two quarts of salt for each bushel of ashes. Many feeders prefer to add a few ounces of copperas to the mixture. Free access to such a mixture will do much to preserve the health of hogs, and sows which have had an abundance of such food will rarely eat their young.

**Cooking the Feed.**—Cooking feed is rarely profitable. It has been tested repeatedly in all parts of the country and with all kinds of feed, often with contradictory results, but those who have tested it most extensively and who have watched its results most carefully are almost unanimous in the opinion that cooking not only fails to increase the meat-producing value of the feed, but often actually causes a distinct loss. Irish potatoes are greatly improved by cooking, but as they are seldom fed to hogs in the South the purchase of a cooking outfit is usually a needless expense for the southern hog raiser. Soaking grain in water and allowing it to ferment before feeding is also seldom profitable, though soaking corn or wheat for very young pigs enables them to begin eating a little sooner. When ground feed—shorts, meal, etc.—is used with skim milk many feeders think it better to make them into a slop and let it stand until it begins to ferment, but the mixture should never be kept until it becomes soured.

#### HOW AND WHAT TO FEED.

Whatever feeds may be used the variety should be as great as possible, and changes should be made at every opportunity. The only object in raising hogs is the production of meat, and the more rapidly a hog can be made to produce meat the more profitable he becomes. The man who makes hog raising the most profitable is the one who induces his hogs to eat the most of the right kinds of food, and who never keeps them on any one kind of grain or forage until their appetites become cloyed and they get "off their feed." The greater the variety and the more frequent the changes the more will be eaten and the more rapid will be the growth.

No matter what food may be used or what the age of the animals which consume it a great saving may be effected by feeding so that none of it will be wasted. While a hog is not over particular about



cleanliness, and will eat food which is covered with almost any kind of filth, still he prefers clean food, and will not waste time and strength in rooting half an ear of corn out of the mud when he sees an ear which has not been soiled. Throwing corn, or any other feed, on the ground is wasteful, and if, as is too often the case, the hogs are kept in a small pen which is trampled and rooted so that it has become a permanent mud hole, the practice is exceedingly wasteful. In managing the grazing lots, especially those on which root crops are grown, the temporary cross fences, already referred to, will save from one-fourth to one-half the feed. It pays, and pays well, to have a floor on which to feed corn; and when shorts or other ground feeds are used they should always be wet and fed in a trough. The trough should have end pieces so long that the hogs can not turn it over, but should not be fastened to the floor, as it will need cleaning often. The feeding floor and trough should be under a shelter if possible. It is never a good plan to feed animals of different sizes in the same pen. When large and small are fed together the small are sure to suffer, no matter how much may be given to the lot. The food which an animal gets by fighting may sustain life, but it will make very little fat. An ample variety of feeds suited to the age of the animals, and a feeding place where none of it will be wasted are the two important factors in profitable hog raising. In regard to feeding hogs, Hon. W. L. Foster, of Shreveport, La., who has been for many years one of the largest breeders in that State, says:

On the hill lands, rye, barley, oats, and artichokes are the best for winter grazing, taking the hogs off the grain crops about the last of February to permit the crops to mature seed. Sorghum, to come in shortly after barley or rye, ought to be planted in Spanish peanuts, sweet potatoes, and peas. Turn the hogs onto the oats when the seed is about ripe; then on the peas, sweet potatoes, and peanuts when sufficiently matured; then on artichokes again for the winter. Of course Bermuda pasture for summer grazing is a *sine qua non*. On alluvial lands I would say alfalfa for pasture the year around, with straight corn, hard (or better if soaked twenty-four hours). The alfalfa should be cut and fed when the ground is too wet to pasture. Hogs should run out at all times, but should have A-shaped shelters to go under when very cold or extremely hot.

For grain feed I think corn alone, and not much of it, good enough with alfalfa or clover. Skim milk with shorts, bran, oats, and corn meal in equal parts is, to my mind, the *best* feed, but hardly profitable for hogs intended for slaughter. I do not think it pays to cook feed, other than turnips, Irish potatoes, or similar crops, which are made more palatable. For growing pigs on alfalfa, soaked corn is good enough; while for pigs on Bermuda grass I think shorts, oats, and corn almost necessary to good results, unless one has plenty of peas, sorghum, and vegetables, or milk. For fattening I prefer the same feeds as for growing except to increase the proportion of corn.

In writing of the same matter, Professor Duggar, of the Alabama Experiment Station, says:

On sandy soils a suitable succession of crops for hogs is a mixture of hairy vetch and oats for spring grazing; permanent pastures, especially lespedeza, carpet grass, and Bermuda for June and part of July; sorghum or permanent pasture for July and a part of August; peanuts for August and September and October; sweet pota-

atoes and the run of cowpea fields for November, and chufas for November, December, and January. The peanut diet, the cheapest of all the methods of growing pork yet tested here, should be discontinued at least two months before the hogs are killed. Corn should be the chief food in the few weeks immediately preceding slaughtering. Some corn must be fed to hogs on pasture, and can be fed profitably even when pigs are running in peanut fields. As soon as we have large enough areas of alfalfa we shall have a still cheaper method of growing pork. If pigs must be grown chiefly on grain, I prefer either a mixture of two parts corn and one part of cowpeas ground together, or shorts. Bran is too coarse. We have found sweet potatoes to be not more than one-fourth as valuable as an equal weight of corn, and yet when harvested by the hogs, sweet potatoes constitute a valuable food on poor, sandy soil.

Director Redding of the Georgia Experiment Station uses nearly the same feeds. He says:

The best succession of grazing crops is vetches (*Vicia sativa* and *V. villosa*), clovers (*Medicago maculata* and *M. denticulata*), red clover and orchard grass, crab grass, chufas, peanuts, sweet potatoes, and artichokes. For permanent pastures Bermuda grass is best for summer, while orchard grass, tall oat grass, red top, red and white clovers are best for winter and spring.

For feeds for the growing period I use shorts, bran, corn meal, and pasture; for the fattening period, peanuts, sweet potatoes, artichokes, and corn meal. Skim milk is undoubtedly good for growing pigs; bran and oats are unexcelled excepting by shorts.

#### FATTENING FOR MARKET.

The cost per pound of growing and fattening a hog for market increases with the size and age of the animal. It costs much less to raise two hogs weighing 300 pounds each than to grow one weighing 600 pounds, and even 500 pounds is too heavy to be profitable under ordinary circumstances. A hog must consume a certain amount of food to maintain his present weight, and for that food the owner receives no returns. Whatever the hog can be induced to eat in excess of the amount required for maintenance goes to the production of growth, and it is from this excess that all gains and profits are made.

These facts make it to the interest of the feeder to induce his hogs to eat all they can digest and to secure gains as rapidly as possible. A pig which is made to weigh 200 pounds at six months or 300 pounds at a year old is always profitable, while if it takes two years to make 300 pounds the last 100 pounds will usually be made at a loss. As the rate of growth, both in proportion to the size of the animal and to the amount of food given, decreases as the hog becomes larger, there must come a time when a pound of increase will cost more than it will bring on the market, and it is a nice point with the feeder to decide when that time will come and to market his hogs before it is reached. Ordinarily, this time will come when the hog weighs from 250 to 300 pounds, but may be reached either above or below those weights.

A hog 1 year old and weighing 300 pounds in November may still make a profitable gain if he has the gleanings of a recently harvested cornfield with an abundance of cowpeas, the leavings of a sweet potato

field, or any similar food which would otherwise be wasted, but if none of these feeds are available, and all the food consumed must be purchased, it will be more profitable to sell at once, even if the weight is not more than 200 pounds.

As showing the increased cost per pound of gain with the increase in weight, Professor Henry, of the Wisconsin Station, has compiled<sup>1</sup> the results of more than 500 tests made at many different experiment stations. More than 2,200 hogs were used in these tests, and the work has been so extensive and carried on through so many years that the results may be regarded as very conclusive evidence. The figures are as follows:

Weight of pigs.	Average feed per day.	Feed eaten daily per 100 pounds of live weight.	Average gain per day.	Feed eaten for each 100 pounds of gain.
<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>	<i>Pounds.</i>
15-50	0.223	5.35	0.76	293
50-100	3.25	4.32	.83	400
100-150	4.79	3.75	1.10	437
150-200	5.91	3.43	1.24	482
200-250	6.57	2.91	1.33	498
250-300	7.40	2.74	1.46	511
300-350	7.50	2.35	1.40	535

From these figures it is seen very plainly that the greatest as well as the most profitable gains are made on the lighter hogs, the last column showing a constant and almost regular increase in the amount of feed consumed for each 100 pounds of gain. Up to the time when the pigs weighed from 200 to 250 pounds each it required an average of 422 pounds of feed for each 100 pounds of gain, while for those exceeding 250 pounds in weight 523 pounds, or nearly 24 per cent more food was required to produce an equal gain. Pigs weighing less than 100 pounds each made the greatest gains for the food consumed, needing only 347 pounds of feed for each 100 pounds of gain, and, if feed were the only consideration, the 100-pound pig would be the most profitable; but there are other expenses which must be charged against him. The cost and care of the boar and sow are the same whether the pigs are butchered at 100 or 500 pounds. Losses are much more frequent among young pigs than among those which weigh more than 100 pounds each, and, while there is a limited demand for "pig pork" at good prices, such pork can not be sold in unlimited quantities, as packers want only hogs which are fairly well matured. These expenses, risks, and market conditions all combine to make a somewhat heavier animal more profitable, even at some additional expense for feed. Although the figures given above represent the actual amounts of food consumed by pigs of different weights, they do not represent exactly the cost of the feed. The food of the younger pigs must consist largely of the

<sup>1</sup> Henry—Feeds and Feeding, p. 551.

more costly feeds, shorts, oats, pease, etc., while the older animals can be kept in good condition on coarser and cheaper foods, such as sweet potatoes, sorghum, or artichokes. When steers are being fattened on whole corn, hogs running in the same feed lot will secure a large proportion of their feed without expense from the droppings of the cattle. This will not be the case, however, when the steers are fattened on other feeds, corn meal giving very little feed for the hogs, and droppings from the steers fed on cotton-seed meal, the common fattening feed in the South, often prove positively injurious.

So long as a pig is making a fair gain on feed of which he gets at least one-half by grazing it is usually profitable to keep him, but after he reaches salable maturity, is in marketable condition, and draws a large proportion of his feed from the crib, he should be sold at once.

Usually it is better to have hogs ready for market as early as November or December, and it rarely pays to feed through the winter for making pork. Summer feeding is cheap while winter feeding is expensive. Pigs farrowed in the spring should weigh from 200 to 250 pounds by fall, and if the market is not unusually depressed it is better to let them go then rather than to feed through the cold weather and risk still lower prices in the spring. If good grazing is assured through the entire winter and grain is not too expensive, winter feeding is sometimes profitable on account of the higher prices which usually prevail in the spring, but ordinarily it is better to winter only the breeding animals and the fall pigs.

For the last few weeks of fattening, corn is undoubtedly the best grain feed, as it produces a meat which is of good flavor, prime, and wholesome. Hogs can be fattened cheaply on many other feeds, but the meat is greatly modified by the feed consumed during the last six or eight weeks, and animals which have been fattened on peanuts, cow-peas, mast, and similar foods should have corn as their finishing feed. Peanuts especially have a very softening effect on the lard, as is shown by Duggar,<sup>1</sup> who found the melting point of lard from corn-fed pigs to be 111.2° F., while that from peanut-fed pigs is only 76.1° F.

Feeding for the finish should not begin more than ten or twelve weeks before the hogs are to be sold. Hogs which have had good grazing through the summer and enough grain feed to keep them growing well take on flesh rapidly during the first few weeks of heavy feeding, but the longer the feeding is continued the slower and more expensive will be the gains. In testing this matter at the Wisconsin Station,<sup>2</sup> where pigs were fed twelve weeks, the average weekly gains during the first four weeks were 11.5 pounds each; during the second four weeks, 11.5 pounds; and during the third four weeks, 9.5 pounds. Although the actual gains during the second four weeks were equal to those of the first four, the increase was made at a much greater cost of food, the

<sup>1</sup>Bulletin 93, Alabama Experiment Station.

<sup>2</sup>Report Wisconsin Experiment Station, 1897.

amount of feed required for each 100 pounds of growth during the first month being 418 pounds, during the second month 461 pounds, and during the third month 559 pounds, or one-third more than was required during the first month. Quick work pays in fattening as well as in growing hogs, and when the animals are on good feed and fail to make a gain of at least 1 pound daily they should be sold or butchered.

The man who is raising hogs in such numbers that he can ship them by the carload should time the farrowing and the final breeding so that he can fill a car with animals of nearly the same ages and weights, as such lots always bring much better prices than do mixed lots containing animals of different sizes and uneven in maturity. The man who raises only a small drove will usually find a demand for them in his local market, and where such a demand exists he will find it profitable to have a few animals in condition for butchering at any time except during the hot summer months.

### DISEASES AND INSECTS.

The diseases affecting hogs in the South are very few, but are somewhat difficult to recognize, and still more difficult to treat successfully. Practically, the only contagious diseases which cause serious trouble are cholera and swine plague, which, though different diseases, resemble each other very closely and require the same treatment. Both are highly infectious and cause the loss of a large proportion of the animals attacked.

#### HOG CHOLERA AND SWINE PLAGUE.

Dr. D. E. Salmon, Chief of the Bureau of Animal Industry, gives the symptoms of these diseases, as follows:

There are first seen the signs of fever, shivering, unwillingness to move, more or less loss of appetite, and elevation of temperature, which may reach 106° to 107° F.; the animals appear stupid and dull, and have a tendency to hide in the litter or bedding and remain covered by it. The bowels may be normal or constipated at the beginning of the attack, but later there is generally a liquid and fetid diarrhea, abundant, exhausting, and persisting to the end. The eyes are at first congested and watery, but soon the secretion thickens, becomes yellowish, accumulates in the angles, and gums the lids together. The breathing is more rapid than usual, and may be oppressed and labored in the later stages. There is a cough which, however, is not very frequent, and generally heard when the animals are driven from their beds. It may be a single dry cough, or it may be paroxysmal. The skin is often congested and red over the abdomen, inner surface of the limbs, under surface of the neck, and on the ears. The color varies from a pinkish red to dark red or purple. An eruption is sometimes seen, which leaves crusts or scabs of various sizes over the skin. There is a rapid loss of flesh, the animal grows weak, stands with arched back, and abdomen drawn up, and walks with a tottering, uncertain gait. There is less and less inclination or ability to move, and the weakness and exhaustion increase until death results.

The symptoms of swine plague in many cases are not noticeably different from those of hog cholera. Frequently, however, the lungs are—extensively inflated in swine plague, and in that condition the breathing is more oppressed and labored, and the cough more frequent and painful.

The course of these diseases varies from one or two days to two or three weeks.

Although there is no known remedy which is invariably successful, Dr. Salmon recommends the use of the following:

	Pounds.
Wood charcoal.....	1
Sulphur.....	1
Sodium chloride.....	2
Sodium bicarbonate.....	2
Sodium hyposulphite.....	2
Sodium sulphate.....	1
Antimony sulphide (black antimony).....	1

These ingredients should be completely pulverized and thoroughly mixed.

The dose of this mixture is a large tablespoonful for each 200 pounds weight of hogs to be treated, and it should be given only once a day.

He also says:

Hogs are fond of this mixture; it increases their appetite, and when they once taste of food with which it has been mixed they will eat it though nothing else would tempt them.

Animals that are very sick and that will not come to the feed should be drenched with the medicine shaken up with water. Great care should be exercised in drenching hogs or they will be suffocated. Do not turn the hog on its back to drench it, but pull the cheek away from the teeth so as to form a pouch into which the medicine may be slowly poured. It will flow from the cheek into the mouth, and when the hog finds out what it is it will stop squealing and swallow. A very easy method is to cut off the toe of an old shoe, insert the cut end into the hog's mouth, and pour the medicine into the shoe. In many of our experiments hogs which were so sick that they would eat nothing have commenced to eat very soon after getting a dose of the remedy, and have steadily improved until they appeared perfectly well. This is particularly the case when the disease is hog cholera.

This medicine may also be used as a preventive of these diseases, and for this purpose should be put in the feed of the whole herd. Care should, of course, be observed to see that each animal receives his proper share.

With these, as with all other diseases, prevention is much better than treatment. If cholera is known to be in the neighborhood the hogs should be confined in a small lot in which there is no stagnant water and where they will be protected from excessive heat or cold. They should be fed well, principally with bran, shorts, and other soft feeds, in which should be mixed a daily dose of the mixture described above. No one who has recently visited a place where the disease exists should be allowed to go near the lot. Care should be taken that the hogs have no access to any ground which receives drainage from an infected locality. Any animals which are purchased should be quarantined at least a month before being put with the drove.

Should the disease make its appearance in a drove, all the animals which appear to be still unaffected should at once be separated from the sick and placed in a pen as far away as possible. Should the disease appear among those which have been moved, the sound animals should be moved to still another place. It is of little use to move the sick, as the lot in which they have been kept is thoroughly infected. Different feeders should care for the sick and the well for fear of carrying the contagion, as a bit of manure no larger than a pin head might easily be carried on the foot from the sick to the pen where the healthy animals are kept, and so spread the disease.

The carcasses of any animals which die from the disease should be burned immediately. Burying them is not safe, as the germs of the disease may retain their vitality for months when in damp soil, and if brought to the surface by dogs or worms, may cause another outbreak of the disease at any time. The lots where sick animals have been kept should be thoroughly disinfected by sprinkling heavily with lime, and should not be used again for at least six weeks. The disease is so fatal and so difficult to treat successfully that too much care can not be taken to prevent its introduction or spread.

#### THE HOG LOUSE.

The hog louse is the only insect which causes much trouble in raising hogs, and when it once becomes established in a drove it is not easily exterminated. Fortunately the lice are so large that they can be seen easily, and their presence may therefore be known before they become very abundant. They are liable to appear at any season of the year, and they thrive on hogs of any age or condition. They are found in and behind the ears, back of the shoulders, and in the creases on the lower part of the ham more frequently than elsewhere; if those places are free from them there is little danger that they exist on other parts of the animal. Coal oil is sure death to every louse it touches, but does not always kill the eggs, and must be used with caution to prevent its blistering the skin of the hog. When a large drove is to be treated, the work can be done very quickly by using a spray pump having an attachment for mixing the oil and water, and the pump should be set so that it will use about five parts of water to one part of oil. When such a mixture is thrown over the hogs in a fine spray, only a little of the oil is used to cover the whole animal, and if the spraying is done in the evening, nearly all of the oil will have evaporated by morning and there will be no blistering of the skin when the hogs are exposed to the hot sun on the following day. So little oil is used in the spraying that few of the eggs will be killed, and the work should be repeated at the end of a week, and again at the end of the second week. If the work is thoroughly done, three sprayings will be sufficient. If a spray pump is not available, the hogs should be rubbed with a mixture containing two parts of lard oil to one of coal oil, repeating twice at intervals of a week. The sleeping places should be thoroughly cleaned, the bedding burned, and the inside of the buildings thoroughly wet with coal oil.

Even with the most thorough treatment it requires time and patience to clean a drove which has become badly infested, but it must be done if the hogs are to be kept in a thriving condition. It is not difficult to destroy the larger part of the lice, but that is not sufficient, for where there are even a few eggs left in the ears or under the jowls of a single animal the pest will soon become as bad as ever.

Lice never infest clean hogs when they are not brought from an infested drove, and the hog raiser who has a clean herd can not be too

careful to keep it so. No stray hog should be allowed on the premises, and any which are purchased should be examined very carefully before they are allowed to run with the others. The oil mixture should always be kept close at hand where it can be used immediately if any indications of lice are seen. It is much easier to kill a few lice on a few animals than to clean a thoroughly infested herd.

### STATEMENTS OF SUCCESSFUL HOG RAISERS.

The following quotations give some of the actual practices followed by successful hog raisers and suggest some of the most serious obstacles likely to be encountered.

In speaking of raising hogs for pork, Mr. Foster, of Louisiana, to whom reference has already been made, says:

I think two litters should be raised where winter pasture can be had cheaply; otherwise only a spring litter to be turned off at eight or nine months. In feeding breeding sows I simply see that they are improving in flesh and strength and have laxative food before farrowing. If pasture does not keep their bowels in good condition, I feed bran or cotton-seed meal for a short time previous to farrowing. On our plantation I put up 32,000 pounds of green bacon last winter at a cost of a little less than 3 cents per pound on corn and alfalfa pasture, charging corn at 40 cents per bushel and pasture at \$5 per acre, but charging nothing for fencing, shelters, or labor, as the pasture (40 acres) furnished a great deal of feed for my colts, mules, and cows. The greatest obstacle to success, I think, is disease caused in a majority of cases by crowding too many hogs together and disregarding sanitation. I never keep more than three or four litters, having my pasture subdivided by portable fences into small lots of one-half to 1 acre each, with a cheap shelter in each lot. I never saw all of a large bunch of hogs do well when fed together. The fewer in a drove the better.

#### Professor Duggar, of Alabama:

Two litters a year are practicable and profitable.

The principal obstacles to success are:

- (a) The want of a market at steady prices. We need packing houses.
- (b) The attempt to make corn, which is high-priced in most Southern communities, the main or sole food for the hog. We need special hog crops, and pastures prepared especially for hogs.
- (c) Cholera, which is largely preventable by proper fencing, feeding, and a knowledge of the means by which it is disseminated.
- (d) The cost of making hog-tight fences around fields where hog crops should be grown.
- (e) Scrub blood.
- (f) Financial loss due to keeping hogs past the age of twelve or fifteen months, and similar errors of judgment due to want of information.

#### Dr. Redding, of Georgia, says:

I prefer to have sows farrow in March, the pigs to be made into bacon the following December; farrow again in September, the pigs to be sold for butchers' meat and consumed fresh. The March pigs in December should net 200 to 225 pounds each. The salted pork should be ready for "smoking" by February 1. The September pigs should be kept in good butchers' condition and sold as the market may demand.

Before farrowing, sows should be kept in good, thrifty condition, but certainly not fat, with moderate exercise required, or at least provided for. After farrowing, the



best and most nutritious and milk-producing food should be given—mashed and scalded oats, shorts, bran, corn meal wet up with water, some green food, and pasture. Plenty of pure, clean water is desirable. The little pigs should be taught to drink skim milk, thin bran mash, and the like as soon as possible. Later they should have a regular allowance of mashed oats, bran, and corn meal, with such green food as may be available. I consider the common collard an excellent soiling food for hogs. The collard leaves are especially suited for growing stock of all kinds, but particularly for hogs. The plants should be set out 1 foot apart, in 3-foot rows, in rich soil, in April. In a few weeks feeding may begin by pulling out every third plant and feeding them whole. Later, each alternate plant of those remaining may be removed and fed. After the patch has been thus thinned to one plant every 3 feet, commence to “prime;” that is, pluck off one or more of the bottom leaves of each plant, and so on all summer and fall.

Lucerne is an excellent soiling plant, better and more convenient than red clover. The saccharine sorghums, and Indian corn (in roasting ear) fed “stalk and all,” are both good.

It should not cost over \$5 or \$6 to produce a hog weighing 200 pounds.

I know of no insurmountable obstacle to profitable hog raising throughout the South. In fact, there is hardly an impediment in the way. Want of well-established pastures is noticeable.

### CONCLUSIONS.

The obstacles mentioned can readily be overcome. Diseases caused by overcrowding can be avoided by building a few fences and cheap shelters. The exclusive or excessive use of corn is wholly unnecessary in view of the many other feeding crops available; and it is not economical by reason of the smaller cost of other feeds which are equally good or better for use, except during the short time of fattening. Scrub blood is as unprofitable in Kansas or Ohio as in Texas or Florida; pure-bloods can be obtained in one place as readily as in another, and with the use of well-bred stock every animal can be made ready for market without keeping it beyond twelve or fifteen months. Packing houses will be built as soon as the supply of hogs is in excess of the local demand, and until then the farmer will find it profitable to be his own packer. The man with a small herd will make a much better profit in proportion to his investment than the man who grows for shipment. With such a favorable climate, and with food crops which can be produced at so little cost, hog raising can be made profitable on every farm in the South.