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RAISING HOGS IN COLORADO

[Information Bulletin]

BY

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RAISING HOGS IN COLORADO

H. M. COTTRELL

ADVANTAGES IN COLORADO FOR RAISING HOGS.

The feeds raised in Colorado for fattening animals are the feeds which produce the choicest flavor in meat that it is possible to secure. Delicious flavor is the marked characteristic of Colorado-fed meat, whether it be beef, mutton, pork, or poultry.

Barley is adapted to every tillable section of Colorado, with the possible exception of the Arkansas Valley. It yields well, is a cheap crop to produce, and barley-fed pork, because of its flavor, sells for the highest prices in every market in the world where it is offered.

Field peas is one of the best yielding and cheapest grown crops in the mountain valleys that have an altitude of 6,500 to 8,000 feet. The flavor of pea-fed pork is considered by many epicures to be richer and more toothsome than that produced from any other feed. Barley yields well in all pea-growing sections, giving the feeders the benefits from both grains. These high valleys cover a large area, one, the San Luis, having a tillable area as large as the State of Connecticut.

Alfalfa thrives on a large part of the cultivated area of the State. Hogs make cheap gains on both the pasture and the hay, and alfalfa gives a choice flavor to the meat.

Barley, milo maize and wheat are profitable hog feeds, and are the surest grain crops for the dry land farming of the plains. Usually in the dry land sections much more can be made from wheat by feeding it to hogs than by selling it for grain.

Pork can be produced cheaply with proper management in Colorado. Barley, under irrigation, costs less an acre to raise than corn in the Mississippi Valley states, and will produce more pork. From 500 to 1,000 pounds of gain can be put on hogs during the season from an acre of alfalfa pasture. It costs, including the rent of the land, from $3 to $6 an acre to raise field peas, and feeders estimate that an acre of good peas, when pastured off, will put 400 pounds of gain on hogs.

MARKET SUPPLY AND DEMAND.

Denver is the chief packing center of Colorado, and hogs have been received at the Denver Union Stock Yards as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Hogs from all sources</th>
<th>Hogs from Colorado points</th>
<th>Received from Colorado</th>
</tr>
</thead>
<tbody>
<tr>
<td>1906</td>
<td>192,720</td>
<td>17,000</td>
<td>8.32%</td>
</tr>
<tr>
<td>1907</td>
<td>241,393</td>
<td>33,951</td>
<td>14.06%</td>
</tr>
<tr>
<td>1908</td>
<td>280,228</td>
<td>61,049</td>
<td>21.78%</td>
</tr>
</tbody>
</table>

The larger part of the hogs received at Denver come from
western Nebraska and western Kansas. Shipments of fresh pork are made every week throughout the year to Denver from Kansas City and Omaha, the average being two to three cars weekly. Experts in the meat business estimate that there are shipped annually from packing houses in the corn belt to Rocky Mountain territory and the Northwest, of which Denver is the gateway, pork and pork products worth from $12,000,000 to $16,000,000.

One hundred thousand hogs are needed each month in Denver territory to supply the demand for pork and pork products.

THE HOG THE COLORADO MARKET WANTS.

The Colorado packer wants a well-finished, fat, blocky hog weighing alive from 220 to 250 pounds. During the winter months there is a good, but limited demand for the city whole carcass trade, for well-finished hogs weighing alive from 150 to 175 pounds each.

Hogs weighing alive 220 to 250 pounds each, will supply cured hams weighing 16 to 18 pounds, and sides of bacon weighing 10 to 12 pounds each. These weights command a premium of 75 cents per hundred pounds above lighter hams and sides.

Well finished hogs, only, are wanted. The hog should be well fattened and rounded out, the flesh coming well down on the hocks, and the fat on the sides should be from 1 to 1½ inches thick. In a finished hog the flesh will be firm and hard to the touch, and the hair will be smooth and lustrous.

The flesh should be firm, the fat pure white, and the best consumers want a good proportion of lean.

Most of the Colorado hogs marketed in the past three years have been unfinished and too light in weight. A well finished hog will dress 80 per cent.; the average at the Denver packing houses in 1908 was 73 per cent.

The chief trouble has been that most Colorado farmers neglect their hogs through the summer, stunting them, and stunted hogs do not finish well. An unfinished, stunted hog weighing 150 pounds, will dress about 65 per cent. Bacon from such hogs sells at wholesale for one-half that from finished hogs. The bacon from the unfinished, light hogs, when cooked, consists of skin and flabby, soft meat, and the consumer is dissatisfied.

The flesh on the live, unfinished hog is soft and flabby to the touch, and the hair has a dead appearance. The meat from an unthrifty hog is always soft, and that from thin hogs is usually soft.

A common fault is uneven quality in a shipment, some hogs being of good weight and well fattened, and others small or thin. Unless the demand is pressing, a car load of mixed hogs will sell for the price which the poorest are worth.
Raising Hogs in Colorado.

Every defect in the form of the live hog, or in his condition, lowers the price of the marketable products from him, and brings a corresponding reduction in the price paid to the feeder. Every hog raiser should spend a day in the market with experts from the stock yards and packing houses, and learn to know how a choice hog appears and the feel of his flesh. The feeder should go to the packing houses and see the difference in the character of the cuts made from well fattened and from unfinished hogs.

The Best Breed of Hogs for Colorado.

The best breed is the breed that the grower likes best. There are more differences in the individuals of any breed than there are between choice animals of the different breeds. A good hog, well bred from a prolific strain of any of the popular breeds of hogs,

will make money for the Colorado farmer when handled right.

There are four breeds that have been found to be particularly adapted to Colorado conditions: Berkshire, Duroc-Jersey, Poland-China, and Tamworth.

Whatever breed the feeder selects, he should stay with it, and not change or cross with another breed.

White hogs are generally not profitable in Colorado. The intense sunshine blisters and cracks their tender skins so that they become runts. Often this blistering is so severe that running sores are formed. A few Colorado farmers have made good profits from

*Owned by J. De Bon, Nashville, Tenn.
white hogs by keeping them in pastures having heavy shade.

The Berkshire is hardy and active, adapting itself to any condition suitable for raising hogs, and may be developed either into a bacon or a lard hog, according to the feed given.

It is more energetic than some of the other breeds, and on this account requires a better fence. Its activity makes it a good hog for pasturing and for following cattle in the feed lot, and this gives it a well developed muscular system that furnishes a good proportion of lean in the meat.

The Berkshire is a good feeder, matures early and may be fattened at almost any desirable age.

The sows are careful mothers and good sucklers. Originally

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**THE DUROC-JERSEY.**

Prize Winning Duroc-Jersey.*

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the Berkshire was very prolific, and many strains are productive today. Some families have been bred to concentrate the blood lines of prize-winning animals until they have become shy breeders, and in selecting animals for breeding, especial attention should be given to securing those with prolific ancestors on both sides. The Berkshire is strong in transmitting characteristics to the offspring.

The Berkshire is an attractive hog, black with white on face, feet and tip of tail. Its head, nose and legs are short, and for this reason the breed is a prime favorite with packers because of the small per cent. of waste from these cheap parts. The fat and lean are well distributed in the meat, making a high quality of pork.

The Duroc-Jersey is a typical lard hog of good length with a

*Owned by C. F. Burke, Rocky Ford, Colorado.
smooth, thick-meat ed body, built close to the ground. It is solid red in color.

It is an active, hardy hog, a good feeder and a good grazer. When well fed, it matures early, and if kept until full grown can be made very heavy.

The Duroc-Jersey is a prolific breed. Records taken from hundreds of sows by the U. S. Department of Agriculture show an average of nine pigs to the litter.

Mature sows can be handled in Colorado to have two litters a year, and the prolific character of the breed, together with its good feeding qualities, have made the Duroc-Jersey very popular.

The carcass often shows more bone than either the Berkshire or the Poland-China, and the meat is often not so fine grained.

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**THE POLAND-CHINA.**

*Prize Winning Poland-China.*

Duroc-Jerseys for breeding should have constitution and quality. Coarseness of bone and hair, particularly of the hair along the back, should be avoided. Hogs of this breed are inclined to have weak pasterns, and breeding animals should be selected that are strong in this respect.

The Poland-China is an almost perfect meat making machine. It is not excelled by any breed of any kind of live stock for converting feed into flesh. It has a voracious appetite, a good digestion, and is lazy—not using much of its energy in travel or excitement. It will stand heavy feeding and considerable neglect.

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*Owned by H. C. Dawson & Sons, Endicott, Nebraska.*
When properly handled, it is ready for the market at any time after six months of age, whenever the price is right.

It is a typical lard hog, with a thick, short, massive body, fine quality of bone, hair and skin, small, fine head and short legs. It is thick fleshed with heavy shoulders and hams, and broad, thick loins. The meat is fine grained, but with too large a proportion of fat in the matured animal.

The chief fault with many strains of the Poland-China is that through over-feeding of corn they have become poor breeders, having only one to four pigs in a litter. Such pigs are usually choice feeders, but the number in a litter is too small to make it profitable to keep the sow.

*THE TAMWORTH.*

Champion at World's Fair—Tamworth, Weight 1,000 Pounds.*

Where sows are selected from prolific strains and fed muscle and bone-making feeds, they are as prolific as any breed. Three Poland-China sows on the Colorado Agricultural College farm had thirty-one live pigs at one farrowing. Records compiled by the U. S. Department of Agriculture of several thousand Poland-China sows showed an average of 7½ pigs to the litter.

The Tamworth is a strictly bacon hog with a smooth, long, deep, thin body, and looks to most people like a "razor back." It has been bred to produce as large a proportion of its weight as possible in an even thickness of choice bacon.

The two strongest characteristics of the Tamworth are lean

*Owned by W. Weaver Morton, Russellville, Tennessee.
meat and large litters. For three years on the Colorado Agricultural College farm the average for all sows was ten live pigs to a litter. A two-year-old sow weighing 750 pounds had 18 live pigs at one farrowing. Fully matured sows, well cared for, can produce two litters a year. A Tamworth sow at the Iowa Agricultural College raised 33 pigs in one year. The Tamworth is solid red in color, and is hardy and active—a good hog to keep on pasture.

The first cross with a pure bred Tamworth produces an easy feeding, rapid growing hog that is generally popular. The second cross is usually unsatisfactory, the pigs in the same litter frequently being of entirely different types, some chunky and others extremely lengthy, with an unpleasant variety in mixtures of colors.

Most Colorado stockmen who have tried the Tamworths do not like them. As a rule, Colorado stockmen neglect their hogs in summer when the field work crowds, planning to give them extra attention in the fall. With this treatment the Tamworth becomes stunted, and once stunted he can never be made profitable, and had better be killed. The surplus fat on the lard hog will carry him over a period of neglect—the Tamworth does not have the lard.

SELECTION OF THE INDIVIDUAL.

The selection of breed is a matter of fancy; the selection of the individual animals for the foundation of the herd is the basis for profit or losses.

The first consideration should be to get both boar and sows from prolific strains, and of the type demanded by the market. Except during the few weeks when the pigs are suckling, it costs as much to keep a sow that has one to four pigs in a litter, as it does to keep one that has eight to ten pigs. The first cost of the new born pig is determined by the cost of keeping the dam, divided by the number of pigs in the litter.

Uniformity in type is essential for the largest profits. No two breeds or types feed exactly alike, and where there is a mixture there is a variation in finish and weight that lowers the selling price. Both the boar and all the sows should be pure bred, of one breed, and of the same type. Miscellaneous crossing is a sure way to reduce the profits.

There are three serious defects to avoid in selecting animals for breeding stock: Weakness through the heart, weak or swayed back, and weak pasterns. These are faults which the swine growers of the corn-belt have learned from years of costly experience to avoid, and no other good qualities will compensate for these defects.
Most of the Colorado stockmen have had but little recent experience with hogs, and look only for good development in ham and shoulder. Breeders in the corn belt have learned this, and ship to Colorado breeding stock that on account of light heart, sway back, or weak pasterns is unsalable at home.

With Berkshire, Duroc-Jersey and Poland-China hogs, the most valuable parts are the hams, back, sides and shoulder. The animal should have a back broad and arched, deep, thick-meatcd sides, and heavy ham and shoulders. The different parts of the body should blend smoothly into each other and be evenly covered with flesh.

In selecting Tamworths, the animals should be strongly of the bacon type; the body of great length between shoulder and ham, the sides deep, and the shoulders and hams light, uniting evenly with the body, so that a straight edge placed on the ham and shoulder will touch the side along its entire length.

**HOW TO START WITH HOGS.**

For capital, labor and time required, there is no business of any kind in Colorado that is paying larger profits than raising hogs where the grower is an expert. As high as 300 per cent. net profit has been made in six months under ordinary farm conditions.

The possibilities of so large profits have induced many farmers and business men who have had no experience with hogs to go into the business.

Many of these beginners with no knowledge have started on a large scale and have lost money. Handling hogs profitably requires skill and experience, and the beginner should start slowly and not get these at too great a cost.

Select any one of the four breeds you like best—Poland-China, Berkshire, Duroc-Jersey, or Tamworth.

Get a good judge of hogs to select for you from one to five sows, not more. Select good individuals that come from prolific strains on both sides.

The man who has had no experience with hogs should start with one choice brood sow. His herd will increase as fast as his ability to manage it.

With careful management, from 12 to 20 pigs should be raised each year from a prolific, mature sow.

The beginner should study his hogs closely, becoming acquainted intimately with their habits, their likes and dislikes, learning what they need and what is bad for them.

Cheapness in production is the first point to be mastered by the beginner. In his breeding he should work for large litters, early maturity and quality.

Starting with one sow, it will pay to buy a mature one that has shown that she will produce good pigs and raise eight to ten at a litter. She should have two litters a year.
Cheap shelter can be made with straw, sod or boards. The beginner can watch his small lot of hogs carefully, and learn how to make them grow rapidly at least expense.

If any trouble occurs it can usually be seen in a small lot of pigs before it is past curbing. When there is a loss it cannot be heavy and the grower gets his experience cheaply.

The second year three or four of the best sow pigs should be saved with their dams.

The third year the grower should have learned enough about growing hogs to be able to handle ten sows and their produce, and after that he should know enough to slowly increase his hog herd to the limit of his farm.

Cheap shelter and fences should be used until the profits from the hogs will pay for better ones. No large building should be erected until hogs have been grown several years on the farm and the breeder is sure of what he wants and where he needs to locate it.

Success in hog raising is determined by intelligent daily, sometimes hourly, care, attention to many small details, and good judgment. When a farmer decides to become a hog raiser, he should plan to stay permanently in the business. Just before the last panic hogs were high and farmers in many sections of the State invested in them. Prices dropped, and many new beginners sold out even the brood sows. In six months prices were again high.

FEED AND MANAGEMENT OF THE BOAR.

The boar is more than one-half the herd, so far as influence goes. Each year he may show his strength or weakness in a hundred or several hundred pigs, and it is most important that he should be of the right type and in great bodily vigor with such strongly bred ancestors behind him on both sides that he will with certainty produce pigs of uniformly profitable type, good feeders that will mature early.

No matter how superior an animal a cross-bred boar may be he cannot be depended upon to transmit his qualities to his pigs. There is a constant likelihood of the pigs inheriting the characters of their scrub ancestors, and no farmer can afford to use any but a pure bred sire.

The boar should be evenly balanced, good in every point. The custom of selecting a boar unusually strong where the sows are weak and perhaps weak where they are strong, is a dangerous one. The pigs can most easily inherit the weak characteristics of both parents.

The newly purchased boar should be brought to his new home
at least six or eight weeks before he is to be used and accustomed to his new surroundings.

As soon as he arrives, he should be thoroughly dipped or washed with some of the coal tar dips for destroying lice, and given the same treatment after ten days. For three weeks after arrival he should be kept at a safe distance from all other hogs on the farm; then, if found free from disease, he may be placed in quarters near them. Dipping and quarantine should be applied to every hog or pig that is brought to the farm, as it will often prevent serious losses from lice and disease that would otherwise be carried by the new purchase to the swine already on the farm.

The boar pig should be pushed with growing feeds, so that he will make a gain every day until he reaches full, mature weight. A mixture of any two or more of the following grains is good: Corn, barley, or milo maize, with wheat, peas, or shorts. A liberal supply of skim milk is especially good. He should have all the alfalfa he will eat every day, either pasture or hay. A small feed of roots or cooked potatoes is good. Stunting, even for a short time, will permanently injure his value. He should weigh 300 to 400 pounds when 12 months old.

After reaching full growth, the boar, when not in service, should be given bulky feeds that will keep him full, satisfied, and in good condition, but that will not put on fat. Alfalfa, roots, and a small daily ration of any kind of grain.

A few weeks before the beginning of the breeding season the grain feed should be gradually increased, giving a mixture the same as when he was growing, and the amount of roots and alfalfa should be slowly reduced. The animal should be put in perfect condition and good flesh, but not made fat. The best results are not secured from a sire that is either fat or thin.

During the breeding season the boar should have an abundance of food, using the same combination as recommended for him while growing, except that just sufficient succulent feeds (alfalfa and roots) should be given to keep his bowels in good condition. A full supply of succulent feeds at this time is likely to make him infertile.

A boar should not be used for much service until he is at least twelve months old. A fully matured boar produces the most vigorous pigs, other things being equal, and if properly fed and handled, may be profitably kept for several years. His tushes should be cut or knocked off as often as they show considerable size.

The boar should serve a sow but once, and two sows a day should be the limit for a mature boar, and then he should have a
day's rest after every second or third day. He should be used before being fed. Handled in this way, a mature boar is sufficient for fifty sows. Over service results in pigs that are dead, weak, or puny at birth.

The boar should have comfortable shelter at all times—dry and free from draughts. His surroundings should be kept free from vermin. Remember, that from a breeding standpoint, he is half the herd. He should have daily exercise to keep him healthy and muscular. A half-acre pasture will furnish this. He will keep better natured and be easier to handle if allowed to run with the barrows outside the breeding season. If allowed to run with the sows during the breeding season, he will weaken himself by over service. At other times there is danger that he will injure the sows.

Keeping him in close, dirty quarters, or allowing him to range over the farm and neighborhood half starved, are both sure ways of making him valueless. Too much attention is rarely given to the boar, and his health and comfort should be looked after every day throughout the year.

It pays to train a boar from his first service to the use of a breeding crate. With it, any size and weight of boar can be mated with any size and weight of sow without injury to either.

**FEED AND MANAGEMENT OF THE SOW.**

A large litter of heavy, vigorous pigs at weaning time is the foundation of profits. The sow should be selected and from birth should be fed and handled to produce such litters.

The sow pig intended for a breeder should be pushed for the first year and given feeds that will make rapid growth, but that will not fatten. Such feeds as milk, alfalfa pasture, or hay, and moderate quantities of grain, such as wheat, peas, barley, milo maize, and shorts. She should weigh from 300 to 375 pounds at 12 months of age when in thrifty condition, but not fat. Ample exercise every day is necessary for health and to develop muscles and lungs. If the sow has made a good growth, she may be bred to drop her first litter when she becomes twelve months of age. She should be in perfect health and in good flesh when bred. The gestation period for the sow is 112 days.

While pregnant, the sow should be given muscle and bone-making feeds that will develop in the unborn pigs size and strong vital organs. The same feeds are needed for this purpose that are required by pigs after weaning. When the sow has good alfalfa pasture, only a small quantity of grain is needed. The sow should be kept in good flesh, but not fat. A heavy condition of flesh is favorable if it is put on with muscle-making feeds and the
sow has been given ample exercise. Under feeding is extremely
detrimental. The pigs from a half-starved sow are weak and un-
dersized at birth, and are stunted while suckling from lack of
sufficient milk.

Constipation in the sow while she is pregnant, or suckling,
must be avoided. Pig eating is often caused by constipation. Laxa-
tive and bulky feeds, such as pasture or alfalfa hay, will prevent
this trouble, and should form part of the daily ration. Exercise
is necessary to keep the bowels in good condition. Small feeds of
roots are good. Heavy feeding of roots is often the cause of weak
or dead pigs at birth. Feeding frozen roots is likely to cause
abortion. The pregnant sow should be fed, sheltered, exercised,
and handled in such a way as to keep her in good flesh and health.
Everything that facilitates this condition tends to secure pigs with
greater vigor and more profitable as feeders.

A blow or a strain of any kind to the belly of the pregnant
sow is likely to result in pigs dead at birth, or pigs born the wrong
way, with the consequent injury to the sow, or her death. Sows
had to step over a six-inch board in passing through an opening
between their yard and pasture. There were many dead pigs at
farrowing, and some of the sows died from trouble while giving
birth. The ground next to a hog pen was eight inches lower than
the floor, and the brood sows had to climb over this step—dead
pigs and dead sows at farrowing time was the consequence. Po-
tatoes were dug with a plow and the land left in ridges. Pregnant
sows had to travel over these to get to a pea field. At farrowing
time there were many dead pigs, and two sows died. A boar al-
lowed to run with sows that are bred will frequently knock them
around and bring the same trouble. Horses or cattle running in
a lot with brood sows will often injure the sows the same way.
Not over five to ten bred sows should be allowed to sleep together,
as crowding in cold weather may result in losses at farrowing
time. Pregnant sows should not be allowed to run with fattening
hogs.

A breeding record should be kept, and two weeks before the
pigs are expected the sow should be placed in a farrowing pen
connected with a dry yard large enough to allow her to exercise.
The feed should be somewhat reduced, without any sudden change,
and her bowels kept loose. She should have dry, sunny shelter,
free from draughts. The sow should be petted so that she will
like to have her feeder handle her.

It is best to have the sows farrow at nearly the same time
and then the owner can watch them day and night during far-
rowing time. There should be just enough bedding for comfort
and dryness. Cut straw or chaff is best. Little pigs often get
Raising Hogs in Colorado.

tangled in deep straw and are either crushed by the sow or die from exposure. Give the sow as little attention as possible while she is farrowing, unless she must have assistance. In severe weather place the pigs as fast as they come in a basket in which a blanket is laid over a warm stone. Keep them well covered, and after all are born and have become warm and dry, take them to their mother and place each one at a teat. Then cover the mother and pigs. During the first forty-eight hours watch carefully, and if a pig strays from its mother, put it back against her body where it will be warm.

Give the sow all the water she wants for the first twenty-four hours after the pigs are born, but no grain. Take the chill off the water in cold weather. For three or four days after the first twenty-four hours, give plenty of water, but feed grain and milk sparingly. Then slowly increase until, when the pigs are three weeks old, the sow is having all the feed she will consume. Give the pigs exercise and sunshine from birth, but do not allow them to get damp nor to be exposed to the wind.

When the sow is given a warm, rich slop, or other milk-producing feeds just after her pigs are born, a strong milk flow is forced. The new-born pigs get too much and have diarrhoea, which often kills them. They cannot take all the milk, and the sow’s udder becomes inflamed and caked. When the pigs suckle, the pain becomes so intense that in desperation she jumps up, kills, and eats them.

Overfeeding and lack of exercise cause the thumps in young pigs, but usually in Colorado, when pigs are thought to have the thumps, they actually have pneumonia, due either to damp beds or exposure to draughts.

Good sows improve for several years in the number and size of the pigs they have at a litter. The U. S. Department of Agriculture compiled the records of over six thousand sows and found yearling sows averaged 6.65 pigs per litter, and five-year-old sows averaged 8.4 pigs per litter. At the Wisconsin Experiment Station year-old sows averaged 7.8 pigs per litter, with an average weight per litter of 14.2 pounds, while sows from four to five years old averaged 9 pigs per litter with an average weight per litter of 26 pounds. The common practice of farmers selling their old brood sows each year and reserving immature ones for breeding is a bad practice, as the older sows are much better mothers and their pigs have a strong advantage in greater vitality at the start.

The beginner had better arrange to have the pigs born in May, when the sows can be turned on pasture soon after farrowing. Most experienced Colorado hog raisers do not want pigs
to come in March or in the first half of April on account of storms and winds. February is a good month for farrowing. The weather may be cold, but there is usually little wind and the yards are not muddy.

The period of gestation is 112 days, and the sow may be bred three days after the pigs are weaned. When mature sows are to have two litters a year, the sow, if bred October 12th, will farrow about February 1st. Allowing the pigs to suckle nine weeks, they will be weaned about April 4th, and the sow bred the second time three days later. The second litter will then be born about July 28th, and if suckled ten weeks, will be ready to wean about October 7th.

FEED AND MANAGEMENT OF THE GROWING PIG.

Pigs should not be weaned until they are at least eight weeks old, and if the sow is not to have a second litter, or if there is time enough in case she is, it is better to let the pigs suckle until they are ten or twelve weeks old. Farmers often get in a hurry and wean pigs when six weeks old; but unless there is an abundant supply of milk, and especially good care is given, the pigs are likely to become stunted, sometimes so severely that they never recover.

The cheapest way to put gains on young pigs is through the sow. She has a strong digestion and can turn coarse grains and pasture into easily digested milk.

The sow should be fed to produce a high yield of milk, and the pigs should be kept with her until they get to eating a full feed of both grain and pasture.

Pigs will begin to nibble at feed when they are about three weeks old. At this age they should be given a little milk in a trough separate from the mother. After they get to drinking the milk freely, add a little soaked whole grain—barley, wheat, peas, milo maize, or corn. Do not give more than they will eat up clean at one time, and clean the trough well before each feeding.

The boars should be castrated before being weaned.

When the time comes to wean the pigs, cut down the sow's ration to water and alfalfa hay. She will dry up without injuring her udder. When she is giving a large supply of milk and all the pigs are taken away at once, her udder is often ruined and she becomes unable to suckle another litter.

When first weaned, feed the pigs from three to five times a day. While with their mother, they took their meals at least every two hours, and too sudden a change is detrimental. After they get to growing vigorously, cut down to two meals a day, and when they weigh 75 pounds each and are on good pasture, feed once a day, and that at night.
RAISING HOGS IN COLORADO.

When first weaned, feed the pigs some skim milk, if possible. It makes the change from mother's milk easier. Whole milk is good, but as butter fat is worth $400 to $960 a ton, it is expensive pig feed. Tankage will take the place of milk, when made about one-fifth the total weight of the grain fed.

A variety of seeds will give larger and cheaper gains than will any single feed. Peas, barley, wheat, rye, milo maize, and corn are the grains to use in Colorado. Soak from 24 to 48 hours, each time, feeding a mixture of at least two grains.

Do not sour the feed, and keep the troughs, pails, and barrels used in feeding sweet and clean.

Half the weight of a two-hundred pound pig should be made from pasture. Alfalfa makes the best pasture, followed by rape, clover, and a mixture of wheat, oats, and barley sown thickly.

A pig should be fed some grain every day. After he gets to growing well, a small quantity of grain is sufficient, but it is never profitable to keep a growing pig on pasture alone and without grain. The pig should make a regular daily gain from birth to fattening without a check of any kind. The growth should be made with the least possible daily feed of grain and the largest profitable amount of forage. Careful daily attention can only determine what these amounts should be.

Pigs need fresh, clean water always before them. If a well is not convenient, the water can be supplied cheaply in barrels to which are attached hog waterers. Do not water directly from a stream. It often carries disease.

They must have warm, dry, clean shelter, free from draught, every night in the year, and they need a shade from the midday sun.

FINISHING FOR THE MARKET.

From 60 to 75 days before the pig is to be marketed he should be confined in limited quarters and fed heavily on grain until he becomes well finished and fattened. Up to this time he should be kept growing every day, but fed as little grain and as much forage as can be done and maintain a thrifty growth, and he should be given ample exercise.

Fattening hogs will make the greatest gains when they have just enough exercise to keep their appetites sharp. A fattening hog should be limited to half an acre, and 25 fattening hogs kept on this area will do better than a greater number. The hogs should be sorted to lots of even size and age, and no matter how many are being fattened, not over 25 should be allowed to run together. Brood sows should not be kept with fattening hogs.

The hogs should be fed at regular hours, either two or three
times a day, and at each feed should be given just a trifle less than they will eat up clean. The profits come from inducing the hog to consume a large quantity of grain and maintain a sharp appetite. The feeder will secure the best results by watching the hogs each time until they finish eating. He will then know whether the hogs are slow about cleaning up the feed, showing over feeding, or whether they clean up the feed quickly and need more.

The hogs should have all the clean, pure water they will drink at least three times a day. Colorado feeds are rich in protein, and a hog eating them needs much more water than when eating corn.

The hog should, before being marketed, be well fattened, smooth and well rounded with a good outer covering of fat, and be firm and solid to the touch. If the feeder will go into a pen of thin hogs and feel them along the loin and back, and then into a pen of well fattened hogs, he can quickly learn the “feel” that indicates a good finish. The hogs should be sorted to an even size and weight before being shipped.

**FEEDING HOGS AT THE COLORADO EXPERIMENT STATION.**

The results obtained from seven feeding experiments with hogs have been published.

Colorado Experiment Station Bulletin 40. W. W. Cooke.

<table>
<thead>
<tr>
<th>1894 '95</th>
<th>Pounds Feed Required for 100 lbs Gain</th>
<th>Gain Per Pig Pounds</th>
</tr>
</thead>
<tbody>
<tr>
<td>California Feed Barley</td>
<td>540</td>
<td>88</td>
</tr>
<tr>
<td>Corn</td>
<td>560</td>
<td>76</td>
</tr>
<tr>
<td>California Feed Barley</td>
<td>430</td>
<td>105</td>
</tr>
<tr>
<td>Corn</td>
<td>430</td>
<td>113</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1896 '97</th>
<th>Pounds Feed Required for 100 Pounds Gain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grain</td>
<td>Skim Milk</td>
</tr>
<tr>
<td>Whole Corn</td>
<td>700</td>
</tr>
<tr>
<td>Ground Corn</td>
<td>540</td>
</tr>
<tr>
<td>Whole Bald Barley</td>
<td>500</td>
</tr>
<tr>
<td>Ground Bald Barley</td>
<td>360</td>
</tr>
<tr>
<td>Whole California Feed Barley</td>
<td>540</td>
</tr>
<tr>
<td>Ground California Feed Barley</td>
<td>430</td>
</tr>
<tr>
<td>Ground Corn and Feed Barley</td>
<td>410</td>
</tr>
</tbody>
</table>

Professor Cooke concluded that one-half more ground corn was required to make a pound of growth than when ground barley
was fed, and that feeding corn and barley together produced a
quarter more growth on a fifth less feed than feeding the two
grains separately. Ground bald barley was one-half better than
whole bald barley. Ground feed barley was one-twelfth better than
whole feed barley, and ground corn was one-fifth better than whole
corn.

Colorado Experiment Station Bulletin 74. B. C. Buffum, C.
J. Griffith:

<table>
<thead>
<tr>
<th></th>
<th>Pounds Feed Required for 100 lbs. Gain</th>
<th>Gain Per Head Pounds</th>
<th>Dressed Meat Per Cent</th>
</tr>
</thead>
<tbody>
<tr>
<td>1900</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn ²₁₅</td>
<td></td>
<td>544</td>
<td>110</td>
</tr>
<tr>
<td>Barley ¹₀₂</td>
<td></td>
<td>49</td>
<td></td>
</tr>
<tr>
<td>Alfalfa Hay</td>
<td></td>
<td>528</td>
<td>105</td>
</tr>
<tr>
<td>Corn ²₁₃</td>
<td></td>
<td>555</td>
<td>96.4</td>
</tr>
<tr>
<td>Barley ¹₃₀</td>
<td></td>
<td>103</td>
<td></td>
</tr>
</tbody>
</table>

Second Test

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Corn ²₁₅</td>
<td></td>
<td>643</td>
<td>65.5</td>
</tr>
<tr>
<td>Wheat ¹₃₀</td>
<td></td>
<td>487</td>
<td>85.6</td>
</tr>
<tr>
<td>Barley ¹₀₂</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corn ²₁₃</td>
<td></td>
<td>609</td>
<td>73</td>
</tr>
</tbody>
</table>

1902

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Sugar Beets chopped in small pieces..</td>
<td>6130</td>
<td>16.75</td>
<td>77</td>
</tr>
<tr>
<td>Ground Wheat and</td>
<td></td>
<td>450</td>
<td>120.25</td>
</tr>
<tr>
<td>Barley equal parts</td>
<td></td>
<td>540</td>
<td>71.25</td>
</tr>
<tr>
<td>Corn, shelled..</td>
<td></td>
<td>420</td>
<td></td>
</tr>
<tr>
<td>Ground Wheat and</td>
<td></td>
<td>400</td>
<td>98</td>
</tr>
</tbody>
</table>

Prof Buffum concluded that sugar beets were unprofitable,
either alone or in combination with grain. Pigs weighing 100
pounds each, fed 99 days all the sugar beets they would eat, and
no other feed, made an average gain per head of 16.75 pounds. It
required 61.3 pounds of beets to make one pound of gain, one ton
of beets producing 32.6 pounds gain. Where sugar beets were fed
with wheat and barley, one ton of beets took the place of 150
pounds of the mixed grain. With a mixture of ground wheat and
barley worth $1.00 per 100 pounds, corn was worth 83.3 cents per
100 pounds. The grain showed a greater feeding value than that
grown in the humid section.
The Colorado Experiment Station.

Colorado Agricultural College, "News Notes." G. E. Morton:

<table>
<thead>
<tr>
<th>Pounds Feed Required for 100</th>
<th>Gain Per</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pounds Gain.</td>
<td>Head Lbs. 12 Weeks</td>
</tr>
<tr>
<td>Grain</td>
<td>Hay</td>
</tr>
<tr>
<td>-------</td>
<td>-----</td>
</tr>
<tr>
<td>Barley</td>
<td>469.4</td>
</tr>
<tr>
<td>Alfalfa Hay</td>
<td>556.0</td>
</tr>
<tr>
<td>Corn</td>
<td></td>
</tr>
<tr>
<td>Alfalfa Hay</td>
<td>483.9</td>
</tr>
<tr>
<td>Barley</td>
<td></td>
</tr>
<tr>
<td>Sugar Beets</td>
<td>591.7</td>
</tr>
<tr>
<td>Corn, Sugar Beets</td>
<td></td>
</tr>
<tr>
<td>Barley 1/4</td>
<td></td>
</tr>
<tr>
<td>Corn 1/2</td>
<td>450.3</td>
</tr>
<tr>
<td>Alfalfa Hay</td>
<td>499.6</td>
</tr>
<tr>
<td>Barley 1/2</td>
<td></td>
</tr>
<tr>
<td>Wheat 1/2</td>
<td></td>
</tr>
<tr>
<td>Barley 1/2</td>
<td></td>
</tr>
<tr>
<td>Peas 1/2</td>
<td>513.3</td>
</tr>
<tr>
<td>Barley 1/2</td>
<td></td>
</tr>
<tr>
<td>Shorts 1/2</td>
<td>476.1</td>
</tr>
<tr>
<td>Barley 9 10</td>
<td>417.4</td>
</tr>
<tr>
<td>Tankage 1 10</td>
<td></td>
</tr>
<tr>
<td>Corn 9 10</td>
<td></td>
</tr>
<tr>
<td>Tankage 1 10</td>
<td>394.1</td>
</tr>
</tbody>
</table>

The pigs averaged 80 pounds each at the start.

Professor Morton concludes: To sum the matter up, corn and tankage make a very cheap and satisfactory ration, producing the largest gains of any ration used. Barley and tankage makes a cheaper ration than barley and wheat, or barley and peas, but not quite so cheap as barley and shorts, although producing the second largest gains. Barley, corn and alfalfa hay proved a very satisfactory ration, being second only to corn and tankage in cheapness, and producing the third largest gains of any ration. The corn and alfalfa hay ration did not prove satisfactory, being the costliest ration used, with the exception of the beet rations. The beet rations were not in the running.

The amount of feed required for one hundred pounds of gain is given, so that one can figure the cost with the prices that prevail in his community.

Dry alfalfa hay was fed in racks, and comparing barley and alfalfa hay with barley and wheat, barley and peas, and barley and shorts; one ton of alfalfa hay had a feeding equivalent of 233 pounds of shorts, 1,000 pounds of peas and 1,467 pounds of wheat.

COLORADO HOG FEEDS.

*Field Peas.*—The chief pea feeding section in Colorado is the San Luis Valley, where the altitude is from 7,500 to 8,000 feet.
Field peas are seeded on unplowed ground in fields of 40 to 320 acres. No further attention is given except to irrigate once or twice. The vines grow and bloom, and the pods fill until killed in the fall by frost, when they cure on the ground without being cut. Hogs are turned into the field, gather the crops, and when fat are shipped to market.

It costs, including the rent of the land, from $3 to $6 an acre to raise peas, and feeders estimate an acre of good peas will put 400 pounds of gain on hogs when pastured off.

Sometimes the peas are harvested and stacked, and the unthreshed vines fed from the stack to hogs confined in yards. An acre of good peas fed in this way will put from 600 to 800 pounds of gain on hogs.

A new method of harvesting field peas at a low cost has been lately developed. The frosted vines are left on the field until they become well cured, and are then gathered without being cut, with the bull rakes used in haying. Some vines are left where the bull rake is started in, but as soon as a full forkful gathers on the rake, the vines are taken up clean without shelling; when a load is gathered, the rake is driven to the stack and the vines placed on the stack with an ordinary hay stacker. Three teams and five men with this method, can gather and stack 20 acres a day at a cost not to exceed $1 an acre.

The pork from hogs well fattened on peas is firm, sweet and tender, and has a most delicious flavor. The following figures show the actual cost per acre to a grower in the San Luis Valley:

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeding</td>
<td>$ .35</td>
</tr>
<tr>
<td>Seed, 60 pounds at $1.75</td>
<td>1.05</td>
</tr>
<tr>
<td>Labor irrigating</td>
<td>.25</td>
</tr>
<tr>
<td>Water rent</td>
<td>.08</td>
</tr>
<tr>
<td>Rent of land</td>
<td>3.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$4.73</strong></td>
</tr>
</tbody>
</table>

The crop was gathered and stacked, and the unthreshed vines fed to fattening hogs confined in a small lot. The hogs made a gain of over 700 pounds for each acre of peas consumed.

Hogs fed peas alone fatten unevenly, some finishing quickly, while others gain, but become unthrifty, showing that a diet of this one grain does not agree with them. Denver packers report that one-half the pea-fed hogs marketed from the San Luis Valley in 1908 were in an unfinished condition.

There are three reasons for this: Peas is a concentrated feed, rich in protein, and feeding them alone to hogs is like giving a man beefsteak only. Where the leaves are eaten with the grain, they help dilute the feed, and it is profitable to feed barley or wheat
once a day. A few trials indicate that a light daily feed of potatoes or roots is beneficial for hogs fattening on peas.

Hogs drink a much greater quantity of water when eating peas than they do when given a starchy feed like corn. When hogs are confined in a small lot, and the peas are fed close to a trough of water, they will take a drink of water between every mouthful or two of peas. When turned into large pea fields to fatten, hogs often have to travel from one-fourth to three-fourths of a mile to water and they wait too long between drinks. Most hogs will travel too much in a large field to finish well.

The peas are often stacked and the unthreshed vines fed through the summer to breeding stock and growing pigs. Sows on this feed give milk abundantly, but become very thin.

The quality of the pork and the cheapness of its production merit a wide development in pea feeding. San Luis Valley has a tillable area equal to the entire state of Connecticut, and if one-half this tillable area was devoted to hog raising, there could each year be marketed from the valley over three million well fattened hogs. The area of land in Colorado adapted to pea growing outside of the Valley is probably greater than that in the Valley.

Field peas thrive in Colorado at an altitude of 6,500 to 8,000 feet. They have, so far, not proved to be a profitable crop at lower elevations. Mr. J. H. Empson, Longmont, who raises hundreds of acres of peas for canning each year, and has made a careful study for 20 years of pea growing, stated to the writer that he believed that field peas would be a profitable crop on irrigated land at an altitude of 5,000 feet, if they were seeded in February. Later seeding would certainly fail.

Barley is adapted to every tillable section of the State, except possibly the Arkansas Valley. The feed and malting varieties of barley yield well in irrigated sections having an altitude of from 5,000 to 7,500 or 8,000 feet, and bald barley is adapted to the plains and to high altitudes. The yield of barley in the irrigated sections will produce more pork per acre than will the average yield of corn in the corn belt. Barley is produced at less cost per acre in the irrigated sections of Colorado than corn in the Mississippi Valley.

The English market is the most critical in the world for bacon. and Denmark sells to England each year bacon from barley-fed hogs to the value of over eighteen million dollars. Danish bacon from barley-fed hogs sells on the English market for an average of 46 per cent. above the average of the American bacon from corn-fed hogs. The high yield of barley, the cheapness of its production, its adaptability to all sections of the State, and the superior quality of the pork made from feeding it, should make Colorado a
Raising Hogs in Colorado.

Great hog raising state.

Barley feeding produces fine pork with choice flavor and a white fat—the three qualities demanded for the highest priced pork products.

The feed and bald barley are not as appetizing as corn, and hogs grow tired of them. It is, therefore, best to feed the barley in combination with some other feed or feeds. Alfalfa, peas and wheat maintain the appetite well. The Danish and Canadian feeders generally use skim milk or buttermilk, and both of these dairy products improve the quality of the meat.

Wheat tests made at many experiment stations show that pound for pound, wheat is equal to corn for making gains on fattening hogs. Professor Buffum found, at the Colorado Experiment Station, that a mixture of equal weights of wheat and barley was worth 17 per cent. more than corn for fattening hogs.

Wheat is largely used for fattening hogs in Western Colorado and on the Plains, and the pork from it is likely to be tough and to waste unduly in cooking. Part of this is probably on account of many wheat-fattened hogs not being well finished. The fat has a dingy color. Often the price of wheat, or the distance to market make it much more profitable to feed it to hogs than to sell it as grain. In such cases the hogs should be fed for 60 to 75 days with barley, field peas, or corn, as these feeds whiten the fat and improve the flavor and texture of the meat.

Wheat Bran.—This feed contains too much woody fibre to be a profitable feed for either growing pigs or fattening hogs. It is sometimes useful to feed to mature breeding animals, when bulk, with a moderate amount of nutrition is wanted, and may be used as a laxative feed just before farrowing. The leaves of alfalfa hay have every good quality of bran as a hog feed, are more nutritious and much cheaper.

Wheat Shorts and Middlings are especially good feed for suckling sows and young pigs, and for fattening purposes are worth about 8 per cent. more than an equal weight of corn.

Oats.—The meat of the oat is excellent hog feed. The hull has about the same value as straw. Usually the high price and the per cent. of husk make it unprofitable to feed oats to fattening hogs.

When oats are fed to hogs they should be ground, and for young pigs the hulls should be sifted out. Oats whiten the fat and give a good flavor to the meat, and can sometimes be used with profit as part of the ration in finishing hogs fattened on wheat or rye. A mixture of equal parts, by weight, of ground wheat and oats, make an excellent ration for growing pigs.
Emmer, usually called speltz, is a drought resisting grain crop, and is a good feed for horses, cattle and sheep, but a poor hog feed, as it has too much husk.

Milo Maize is one of the best drought resisting crops, and is well adapted as a grain crop for hog raising for the Plains. It should be either ground or soaked. One hundred pounds of milo maize is equal to ninety pounds of corn for fattening hogs. The average amount of pork that can be produced an acre per year is much greater under dry land farming with milo maize than with corn. Milo maize is constipating, and some laxative feed should be given with it, such as alfalfa hay, flax seed, in small quantities, sorghum fodder cured green, tankage or bran.

Rye makes a good feed for growing hogs. It has the same defects as wheat and should be prepared and used in the same way as wheat.

Tankage consists of the scraps and trimmings of meat and bone from the packing houses, cooked, the fat removed and the residue dried and ground. It is rich in protein and in mineral matter, and should be fed in small quantities mixed with grain. It is of special value when fed with starchy grains, such as barley, corn and milo maize, and when fed with these grains in the ratio of 95 pounds of grain to 5 pounds of tankage, will reduce the amount of feed required to make 100 pounds of increase in live weight from 20 to 35 per cent. Tankage-fed hogs finish well, the flesh is fine and the hair and skin thrifty.

Tankage is the best substitute for skim milk for feeding pigs just weaned, and should form one-fifth of the total weight of grain fed for a short period, and then one-tenth, until they get to eating alfalfa well.

Skim Milk.—No other feed is equal to milk for feeding pigs just weaned. It makes the change from mother's milk easier. Whole milk is good, but as butter fat in Colorado is worth from $400 to $960 a ton, it is expensive pig feed. Skim milk should be fed sweet and mixed with the grain. It has the greatest value when not over three pounds of milk are fed for each pound of grain, and when fed in this ratio, from 325 to 475 pounds of skim milk have a feeding value equal to 100 pounds of grain for feeding hogs.

Skim milk is a valuable feed for fattening hogs, and it improves the quality of the flesh. The high quality of both Canadian and Danish bacon is undoubtedly due, in considerable measure, to the feeding of skim milk or buttermilk to hogs throughout their lives. Milk is an easily digested feed, it aids in the digestion of the grain fed with it; it is appetizing and healthful, and fed to the growing pig promotes development of muscle and bone.
Raising Hogs in Colorado.

Buttermilk, fresh untainted, and not diluted or over salted, has a feeding value equal to skim milk.

Sugar Beets.—In experiments made at different times by Professor Buffum and Professor Morton, at the Colorado Experiment Station, it was found unprofitable to feed sugar beets to hogs.

Professor Buffum concluded that sugar beets were unprofitable either alone or in combination with grain. Fed alone, one ton of sugar beets were required to produce 32.6 pounds of gain, and when sugar beets were fed with wheat and barley, one ton of beets took the place of 150 pounds of grain.

Professor Morton reported that when sugar beets were fed with grain to fatten hogs, they proved wholly unsatisfactory.

At the Experiment Stations of Montana and Utah, sugar beets fed in small quantities with grain to fatten hogs were found to be valuable.

Professor Day, of Ontario, made many experiments in feeding roots, and found that in feeding roots with grain to fatten pigs, one ton of sugar beets was equal to from 250 to 330 pounds of mixed grain. He obtained the best results by feeding equal parts by weight of beets and meal. The influence on the firmness of bacon was very favorable.

Potatoes.—No tests have been made of feeding potatoes to fatten hogs at the Colorado Experiment Station. Several other stations have tried them, and it has been found that potatoes alone do not make a satisfactory feed, and that raw potatoes have little feeding value. Potatoes cooked until dry and mealy and mixed with raw grain make a palatable feed, and from 400 to 450 pounds of potatoes are equal to 100 pounds of grain.

Apples.—There are a good many cull apples available for feeding hogs in the fruit sections of Colorado. Three tests of feeding apples with grain were made at the Utah Experiment Station. In one, apples were of no value; in the second, 25 pounds of apples were required to make one pound of gain; and in the third test, apples were equal to grass pasture.

Squash.—In some sections of Colorado stockmen fatten hogs exclusively on squashes, feeding them raw. They report profitable returns per acre with meat of good flavor, but with an objectionable yellow color. We have been unable to secure any data upon the pounds of pork made per acre of squash.

Gleanings.—Many Colorado farmers have found it profitable to put a hog fence around their farms. After the crops are harvested, the hogs are given the run of the farm. They pick up the scattered grain in the stubble fields, graze on the alfalfa, and eat what beets and beet tops they want. Hogs given good shelter thrive well under these conditions, and often several hundred dol-
Pasture for Hogs.

Grain is high priced in Colorado, and at least half the weight of a 200-pound hog should be made from forage. Raising a hog without pasture in Colorado usually is a losing business. At the same time, a growing pig should have some grain every day, no matter how good the pasture. Sometimes it is profitable to keep dry, mature sows on pasture alone, but it may be taken as a general rule that every hog should have some grain every day of his life.

The feeder should keep a close daily watch on his growing pigs and keep them steadily gaining in weight, using the least amount of grain and the largest amount of pasture that can be done and secure a regular, good growth.

No matter what the size of the pasture, it is best to divide it into at least two lots and change from one to the other as the hogs eat the feed down. Hogs do not thrive best on soiled pasture, and do better when changed often enough to keep the feed clean.

Rings may be put in the hog’s noses to prevent them from rooting; but if the pasture is sufficiently large and some grain is fed daily, the hogs will do little damage from rooting and are better off for it.

Alfalfa makes the best hog pasture. It is best not to pasture it until the second or third years of growth, and in Colorado alfalfa will usually furnish good feed from April 20th to Christmas, and sometimes later.

When hogs are fed some grain daily, they will make from 500 to 1,000 pounds of gain during the pasture season from an acre of good alfalfa after deducting the gain which the grain will make if fed alone.

An acre of alfalfa pasture is sufficient for from five to twenty pigs, depending on their size, the richness of the land, the season, and the amount of water available for the growth of the plants. It does not pay to pasture too close, and a good plan is to allow an acre of alfalfa for each sow and her pigs, and cut for hay what they leave.

Dwarf Essex Rape is next in value to alfalfa for hog pasture. It is similar in appearance to cabbage that does not head. It is a rapid grower, starts up again quickly after being pastured down, and will withstand severe frosts. It does well under dry land farming if seeded so early that it becomes well developed before drought and hot winds come. The writer has found it green and thrifty in the
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San Luis Valley in November under eight inches of snow.

Rape is an annual, and can be sown as early in the spring as oats. It may be sown at any time from March to September. When planted in rows two feet apart and cultivated, from three to five pounds of seed are required per acre. Sown broadcast and irrigated, from five to six pounds of seed are needed per acre. Oats, or a mixture of oats, wheat and barley, may be drilled in deeply and rape sown broadcast afterward and covered lightly.

Hogs should be turned on rape when it is from eight to ten inches high. If the hogs do not keep the rape eaten down, it should be clipped with a mower occasionally. Where hogs run in tall rape it is likely to make sores on their backs.

At the Wisconsin Experiment Station, where shotes were fed grain and pastured on Dwarf Essex Rape, one acre of rape was equivalent to 2,600 pounds of grain.

Grain Pasture.—In the San Luis Valley and on the plains grain is often sown for hog pasture, using double the amount of seed necessary for a crop of grain. Rye is hardy, makes the earliest pasture, but soon becomes tough and bitter. Winter wheat pasture lasts longer than rye pasture. Good results have been obtained by sowing in the spring, a mixture of winter wheat, oats and barley, and reseeding once or twice during the summer.

Sorghum, sown in narrow rows and thoroughly cultivated until a foot high makes a good hog pasture in the dry land section of the Plains.

Sweet Clover makes a good hog pasture on dry lands and on alkali land in irrigated sections. Especially good profits have been made pasturing hogs on sweet clover with a little grain on alkali land in the San Luis Valley.

Hay for Hogs.

Alfalfa Hay.—A Colorado hog should have alfalfa every day in the year. When pasture is not available, the hog should have bright, early cut alfalfa hay. At the Kansas Experiment Station the writer fattened one lot of hogs on all the grain they would eat, and another lot on all the grain and all the dry alfalfa hay they would eat. The alfalfa was cut early and was fed just as it came from the stack, forkfuls of whole hay being thrown in shallow troughs, the pigs being allowed to eat the leaves, and the waste stems being thrown out. The hogs on grain alone gained 524 pounds, while the hogs fed grain and hay gained 909 pounds. One ton of alfalfa hay took the place of 868 pounds of grain.

Professor G. E. Morton reported a test made at the Colorado Experiment Station in which one ton of alfalfa hay had a feeding equivalent of 233 pounds of shorts, of 1,000 pounds of peas, and
of 1,467 of wheat. Of course, alfalfa hay does not in itself have any such great feed value, but the hog eating alfalfa hay digests a greater proportion of the grain eaten.

The leaves only, are of value, the stems being too woody, and the hogs should be fed a sufficient quantity so that they will get all they want when they have eaten the leaves. For this reason it does not pay to cut or grind alfalfa hay for hogs, as these methods compel the hog to eat the indigestible stems. In a test made by the writer, hogs fed whole alfalfa hay ate 515 pounds of grain for each 100 pounds of gain, while those fed finely cut alfalfa hay required 538 pounds of grain for each 100 pounds of gain.

Alfalfa for hay for hogs should be cut when the first few blooms appear, cured with as little exposure to the sun as possible, and handled in such a way as to preserve the leaves. In feeding tests made by the writer with hogs fattened on grain and alfalfa hay, a ton of early, green-cured alfalfa hay was equivalent to 868 pounds of grain, and a ton of alfalfa hay cut late was equivalent to 333 pounds of grain.

Pea Hay.—In the San Luis Valley peas are harvested and stacked after the vines are killed by frost. The unthreshed vines are fed to brood sows and growing pigs through the summer. It is an advantage to feed the vines with the peas, and as in the case of alfalfa hay, the pigs should be fed enough so that they will eat the leaves only.

Sorghum Hay.—On the Plains, sorghum is thickly planted in rows, cut when the seeds are in the milk, and cured in large cocks. The green hay made by this method is a valuable feed to give in winter with grain.

WATER FOR HOGS.

Most Colorado hog feeds are rich in protein, and animals eating such feeds need a much larger amount of water than hogs fed on starchy feeds like corn. It is usually best to mix ground grain with water to make a thick slop, but no matter how much slop is fed, hogs should have easy access at all times to clean, pure water, separate from the feed.

It is dangerous to let hogs have access to irrigation ditches or streams, as these are great carriers of disease. A convenient way to water hogs is to mount a barrel on a small sled and attach a hog waterer. As many barrels and sleds can be used as are needed to maintain a full supply of water, and by this method the water can be placed in the pasture or feed lot where the hogs can reach it without travel. A hog should drink small quantities of water often, and not overload the digestive tract with large quantities, as he will when he has to travel a considerable distance for it.
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Preparation of Feed.

Grinding and Rolling.—The dry climate and intense sunshine in Colorado make the grain much harder and more flinty than those grown in the humid region. It is, therefore, usually not profitable to feed dry, whole grain. Rolling is preferable to grinding, and requires less power. Rolled grain is left in the form of flakes, while in grinding hard grains like Colorado barley, the ground particles of grain have sharp edges that are objectional. At the Colorado Experiment Station, Professor Cooke reported that ground bald barley was one-half better than whole bald barley; that ground feed barley was one-twelfth better than whole feed barley, and that ground corn was one-fifth better than whole corn.

Soaking.—The general experience of swine feeders in Colorado is that soaking grain from 24 to 48 hours has the same beneficial effect as grinding, at less cost, but with more trouble. Care must be taken in hot weather not to let the soaking grain sour, and in cold weather to keep it from freezing until eaten.

Cooking grain reduces its feed value. It has been found necessary to cook potatoes where any considerable quantity has been fed to hogs, and several feeders report good results from cooking sugar beets thoroughly, and then mixing the grain with the beets while they are still hot, but after the fire has been removed.

Lice on Hogs.

Whenever a pig has good feed and surroundings and is not thriving, look for lice. Vermin will usually be found to be the cause of the lack of thrift. A great many of the losses laid to cholera, worms and mysterious diseases are actually the work of lice.

A stockman new in the hog business, bought several sows. He built good shelter and gave them good feed and care. They had 150 pigs, and all of these but 12 died before weaning time. After 138 had died, a veterinarian was called in to find what disease was killing the pigs, and he found that they had all been killed by lice. They were covered with vermin.

The writer inspected a herd of 300 hogs running on an alfalfa field and fed grain. They had a greyhound appearance, with rough hair, and were not over half so heavy as they should have been. After looking them over, the writer said that lice were stunting the hogs. The owner insisted that there was not a single louse on the whole herd. Several hogs were caught and were found to be very lousy.

The best cure and preventive is regular dipping, using some of the coal tar dips so extensively advertised and sold, or crude oil. When pigs are found to be lousy, dip twice, ten days apart,
and then once a month through the year. Dipping with coal tar dips not only kills the vermin, but keeps the skin and hair in a healthful condition and is worth the cost of the operation, aside from killing the lice.

The most convenient method is to sink a galvanized iron vat, the top level with the ground, and leave a shute leading from the hog lot to the vat, and another from the dripping board to the lot. The dipping mixture can be kept in the vat all the time and be protected by a cover when hogs are not being dipped. With such an arrangement, it is a short and easy job to dip 50 to 200 hogs. The dipping mixture will need to be changed three or four times a year.

In Colorado it is safe to dip in winter if done on a warm, sunny day, and the hogs are kept in the sun and out of the wind until dry.

Where only a few pigs are kept, they may be treated by washing them thoroughly with a cloth or sponge wet with the dipping solution.

Besides dipping, the hogs should have short posts set for them in their yards and pastures. Wrap the posts with old potato or bran sacks and once a week saturate these sacks with crude oil. A louse bites the hog, he rubs the spot on the sack and the oil kills the louse.

When hogs are found to be lousy, their sleeping, feeding and resting places should be thoroughly cleaned, all bedding burned, and these places sprinkled or sprayed with the dipping mixtures. Pregnant sows should not be run through the dipping vat.

SHELTER AND CONVENIENCES.

The average change in temperature each 24 hours in Colorado is 20 degrees. For hogs this necessitates a dry, warm shelter, free from draughts every night, both summer and winter. Hog cholera is found in Colorado only in localities where it has been brought from other states; but the losses in hogs from pneumonia and rheumatism are as great in Colorado as the losses in the corn belt from cholera, and are caused by needless exposure.

The beginner in hog raising should start with cheap shelter, and not put up any large buildings until he can do so from the profits of his hogs. Usually, after he has learned the business, he will not want large buildings. The shelter should be warm, light and dry, free from draughts, but well ventilated and easy to disinfect in case of disease.

Hogs should be comfortably bedded, but it is best to use just enough bedding to keep them warm, and to change it once or twice a week. Where a large quantity of bedding is supplied it
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becomes damp underneath, causing rheumatism; and dusty on top, giving the hogs a dry, hacking cough. Both dust and dampness are opposed to thrift.

When hogs are not supplied with plenty of comfortable bedding in cold weather, they pile on top of each other to keep warm. In this way the under ones become heated, and when they get out into the cold air are easily attacked by pneumonia and rheumatism. If the attack is not sufficient to kill them, it makes them unthrifty. It is best to allow only a limited number of hogs to sleep together, and they should have such shelter and bedding that they can keep warm without becoming heated. Bathing in cold water in irrigating ditches is likely to result in rheumatism.

Hogs are more disturbed by wind than any other farm animals. Their shelter should thoroughly protect them from wind and from draughts.

The Portable Hog House is cheap and convenient. It is eight feet wide, eight feet long, and the roof is eight feet in length, making the building seven feet high. The door in front is two and a half feet wide, three feet high, and another at the back, near the top is 12x18 inches. The small door may be covered with heavy muslin, admitting air and light without draught. The frame is made of 2x4's and is covered with drop siding. No floor is used. When it is desired to move the building, it may be tipped over onto a low wagon or stone boat. This is the house we recommend for beginners. It is cheap, and often old material can be used in building it. It is easily moved and easily disinfected and can be changed so frequently that it may be kept on clean ground, free from disease. When a sow farrows in cold weather, a lantern hung to the roof will keep the building sufficiently warm.
The Piggery of the Colorado Agricultural College, is a satisfactory building where a permanent one is wanted. The partitions between the pens are movable in case it is desired to use the building for fattening hogs. The doors leading to the yards are raised from the central alley by means of ropes and pulleys. A shute across the ends of one set of yards makes it an easy matter to dip hogs regularly. It is 6 feet to the eaves and 16 feet to the ridge above the pens. Additions to this house can be made when desired and the building remain just as convenient.

The Johnson Shelter for Fattening Hogs.—F. D. Johnson, Wray, Colorado, uses a portable shelter for fattening hogs that is the best for the purpose the writer has seen. It is a shed, open on the front only. It is 16x16 feet, 4 feet high in front, and 20 inches high at the back. It has no floor, and is mounted on two runners 20 feet long, made of 4”x4” timbers. The front is boarded down 20 inches from the top. The roof is of battened boards and must not project beyond the sides or the stock will rub it off. The building can be moved easily by a team, and the low roof keeps the hogs from piling on each other and becoming over heated. This is the special advantage of this house and it is particularly adapted for hogs in the pea fields of the San Luis Valley.

Alfalfa Rack for feeding alfalfa hay to hogs. The rack is made of 1”x4” stuff. It is 3 feet high, 6 feet long and 16 inches wide. The top is open, the ends solid, and the 4-inch slats have four-inch spaces between them. The trough is 4 inches deep and extends 7 inches beyond the bottom of the rack.

Alfalfa Rack.