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## EC206 Draft Horse Management

Ross H. Miller

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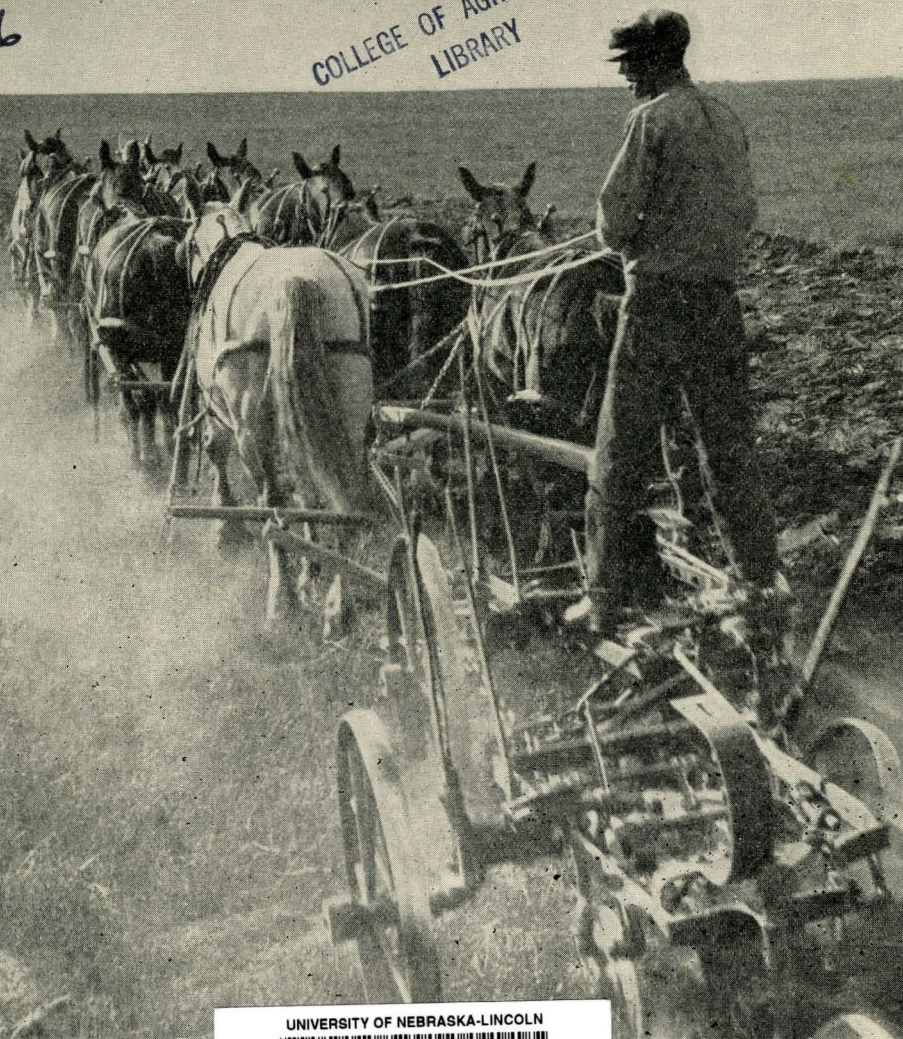
EXTENSION CIRCULAR 206  
**DRAFT HORSE MANAGEMENT**

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THE AIM of this circular is to discuss problems of importance to the owner of draft horses in Nebraska. It is a new circular and when the present supply is exhausted it will be revised and reprinted and kept available for Nebraska farmers. Suggestions will be welcomed.

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*Lincoln, Nebraska*

*August, 1939*

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# Draft Horse Management

ROSS H. MILLER

Department of Animal Husbandry

WITH THE RECENT TREND toward mechanized farming many pages have been written regarding the comparative merits of the horse and tractor as a source of farm power. Further, it is well known that the horse and mule population has steadily declined since 1920. How long this decline will continue is not known; however, the general increase in the prices of horses and mules since 1934 has increased the interest of many farmers in horse breeding. It is apparent that this increase in prices cannot continue indefinitely, but farmers need not become alarmed about immediate overproduction since the scarcity of sires and brood mares, together with the advanced average age of the latter, makes it impossible to do more than check the downward trend within the next few years.

The decline in horse and mule population of Nebraska and her two neighboring states, Kansas and South Dakota, has been more rapid than in any of the other midwestern states. Drouth and resultant feed shortages have been the principal factors responsible for this decline. With the return to a normal feed situation this condition is likely to be changed.

Nebraska's average total yearly income from agriculture for the ten-year period 1926 to 1935 was \$295,247,300. Over 70 per cent of this income was derived from the sale of livestock and livestock products. Nebraska normally produces large amounts of feed crops, a part of which may be used by draft horses and mules to furnish economical drawbar power on all kinds and sizes of farms. Over half the total area of Nebraska is pasture and hay land. Good grass and wild hay in the western half and a surplus of cheap roughages in the eastern half make the state well adapted to the raising of horses and mules.

Draft horses can be managed so that they will furnish power with very little cash outlay. Expenditures such as harness upkeep, an occasional veterinary bill, medicines, stallion service fees, shoeing bills, etc., are about the only things that require cash outlay. Horses furnish their own replacements. Their power is reliable and also flexible, since they may be used singly for light work or in larger teams for heavy work.

Draft horses fit into a soil-conservation program because they can utilize forage and pasture crops efficiently for a large portion of their annual feed supply. There are but two ultimate consumers of farm crops—man and horse. Other than the horse, farm animals are merely food factories converting feed crops into meat, milk, butter, eggs, and other foods for man. Man requires the products from two acres (with average yields) and the horse four acres per year for a liberal diet. The average Nebraska farm that is dependent on horses for power requires one horse for each 28 to 30 acres of tilled land. Since six to seven good drafters will furnish sufficient power for a 200-acre livestock and grain farm, only 24 to 28 acres of the farm must be set aside to furnish feed for the horses. This also means that the crops from this acreage will not go on the open market in competition with other feed crops.



### THE SITUATION IN NEBRASKA

Of the 584,000 horses and mules in Nebraska on January 1, 1938, approximately 175,000 were between the ages of three and eight, which means that there are around 289,000 that are nine years old or older. Based upon a normal age distribution, and the assumption that the average horse or mule lives to give thirteen years of farm service, there should be 40,000 horse and 5,000 mule colts that reach the age of three years each spring in order to maintain the present number. However, since such a large percentage of the work animals in Nebraska are over nine years old, horsemen and farmers will find it necessary to have more than 45,000 three-year-olds ready to go to work each spring in order to offset the rapid death rate of the older animals.

A mare's most productive years are between the ages of three and ten. Nebraska at the present time has approximately 90,000 mares within those ages. If all of these 90,000 mares had been bred in the spring of 1938, only 45,000 colts would under average conditions reach the age of three the spring of 1942.

Under the most ideal conditions it is doubtful if the rate of decline can be checked within the next two or three years. The reasons are: first, some of the farmers who may be a little short on horse power will be hesitant about breeding their work mares because they hesitate to lose ten or twelve days' work from the mare at foaling time; second, it is doubtful if there are enough stallions and jacks properly distributed throughout the state to breed a large number of mares.

Even though the prices of good horses and mules should increase somewhat during the next few years, the future trend is dependent upon the total colt production, the increase of mechanical power, and of course the general agricultural situation. The following table shows the change of horse and mule values since 1930:

NATIONAL AVERAGE FARM VALUE PER HEAD

<i>Year</i>	<i>Horses</i>	<i>Mules</i>	<i>Year</i>	<i>Horses</i>	<i>Mules</i>
1930	\$69.98	\$83.93	1935	\$77.05	\$99.34
1931	60.64	69.23	1936	96.79	120.42
1932	53.48	60.70	1937	99.06	129.73
1933	54.12	60.42	1938	90.00	122.00
1934	66.88	82.42			

**Equine encephalomyelitis or "sleeping sickness."**—This disease probably has been in existence in Nebraska for many years. Veterinarians who experienced the outbreak of the "Kansas horse plague" in 1912 are generally of the opinion that it was equine encephalomyelitis. The recent outbreak in Nebraska and other western and midwestern states has no doubt influenced many farmers to switch partially and in some cases wholly to motorized power. Many new developments and additional information concerning the disease and its control now make it possible for farmers in Nebraska to own and work good horses without fear of losing them. Dr. S. W. Alford, Extension Livestock Sanitation Specialist, University of

Nebraska, has made the following statement regarding this disease and its control:

"Equine encephalomyelitis is caused by a filtrable virus which is found in the blood during the period of invasion and rise of temperature in artificially inoculated animals, but disappears and becomes fixed in the central nervous system before any symptoms are observed. The virus does its damage to the central nervous system and thus brings on all the symptoms so familiar to the horse owner.

"Two distinct types or strains of the virus are recognized—the eastern and the western. The eastern type appears to be much the more virulent, and is found in states along the Atlantic seaboard. The western type is found in other parts of the United States.

"It has been proved experimentally that the virus can be transmitted from animal to animal by mosquitoes. Other biting insects are suspected of being able to do the same, but the question of transmission still remains unsolved in some respects.

"The disease is seasonal. Prior to 1938 it was most prevalent during the months of July, August, and September, but in 1938 a number of cases were reported as early as June 1. Each year it disappeared rapidly after the first killing frost.

"It will attack horses of any age, breed, or sex. Mules appear to be not so susceptible as horses. It manifests itself in two forms, the walking type and the sleeping type. In all types, the initial symptoms are fever and a degree of dullness. In the sleepy type, these first symptoms are followed by muscular tremor, unsteady gait, head hung low, lips pendulous, and eyes half closed. If the animal goes down and lies on the sternum, the weight of the head is supported by the muzzle resting on the ground.

"The walking type of case insists on moving about, usually in a circle. The animal seems to be blind, for it will bump into objects and stand pushing against immovable ones. If it goes down, it tends to stretch out on its sides and the front feet continue to move. In both forms, the inability to swallow is quite constant.

*"Horses affected with encephalomyelitis should be placed under the care of a veterinarian as soon as possible after the symptoms of the disease become apparent."*

"The most valuable means of prevention is by vaccination before the disease appears. A new vaccine appeared on the market last year, known as equine encephalomyelitis vaccine (chick), so named because it is made from chick embryos. Field reports following the use of this vaccine last year, 1938, were remarkably good and it is recommended that if vaccination is considered as a preventive measure, this product can be relied upon to produce an immunity for at least a season. Since the outbreak in 1938 began about June 1st, it is recommended that preventive vaccination be completed by that date or before.

"The use of any product other than the recognized vaccine is utterly useless and only tends to build up a false security which will certainly lead





*Livestock farming requires a team and feed wagon.*

to disaster if the disease should strike the herd. The use of hemorrhagic-septicemia, mixed-infection, and influenza vaccines and similar products should be discouraged if not prohibited. These products are commonly referred to as 'the ten-cent dose.'

"Since the infection may be transmitted by mosquitoes, it seems advisable not to keep horses at pasture from an hour or so before sunset to an hour or more after sunrise. Keeping horses stabled during the night may avoid excessive mosquito contacts and this would be particularly the case in screened stables from which mosquitoes have been eliminated by the use of sprays or fumigation."

### **NUTRITIVE NEEDS OF THE HORSE <sup>1</sup>**

The draft horse and mule are machines capable of converting home-grown concentrates and roughages into drawbar power. Their efficiency as work animals and their length of life are dependent to a large extent on the feed, care, and management they receive from birth until their years of usefulness are completed. The average working life of a horse and

<sup>1</sup> Experiment Station Circular 40, *A Manual for Hog Raisers*, by Wm. J. Loeffel, contains a full discussion of general principles of nutrition. A great deal of this information can be applied to draft horses.

mule on the farm is about twelve to thirteen years. It never pays to let the work horse become run down and unthrifty, as his efficiency is thus impaired and it will require considerable time and feed to repair the damages. The nutritive needs of the draft horse are dependent upon the kind and amount of work he is required to perform. They consist of a need for a considerable amount of energy-producing material, sufficient protein, and an adequate supply of minerals.

**Energy.**—The main energy-producing materials are carbohydrates and fats. Since the cereal grains furnish an abundant supply of starches and sugars which make up the carbohydrates, they are the most important feeds for the draft horse at hard work. Roughages also supply carbohydrates. It is important that a correct balance between the grains and roughage be maintained. The draft horse has a relatively small stomach and therefore when at hard work needs more concentrated energy-producing feeds, such as the cereal grains, than when idle. As the amount of work is increased the amount of grain fed should be increased and the roughage decreased.

**Protein.**—Protein is a material used by the body to build and repair muscles. It is also necessary for the growth of organs, bones, hair, and connective tissues. Protein is the most costly portion of the ration and therefore should not be supplied in excessive amounts. The legumes are one of the cheapest sources for the draft horse. Brood mares, during the gestation period and while suckling foals and growing colts, have a need for a larger percentage of protein than other horses do.

**Minerals.**—The minerals furnish material for the growth of bones, teeth, and certain other tissues. Here again, brood mares and growing colts need more mineral matter than other horses do, whether idle or at work. Common grains are relatively low in mineral but most of the roughages, especially the legumes, contain a sufficient amount to insure proper growth and maintenance. Steamed bone meal is one of the best sources of mineral matter if it is necessary to supply additional minerals to the average ration.

**Goiter areas.**—There are a few scattered districts throughout the Great Plains where there are mineral deficiencies to the extent that goiter is prevalent among newborn foals. This deficiency may be corrected by sup-

*Draft horses are a source of economical power.*





plying potassium iodide in the ration of the brood mare. Foals as well as brood mares should have free access to iodized salt—100 pounds of salt and 2 ounces of potassium iodide thoroughly mixed.

**Salt.**—The average horse seems to require more salt than any other kind of farm animal. He will consume from  $\frac{1}{2}$  to  $3\frac{1}{2}$  ounces of salt daily, or an average of about  $1\frac{3}{4}$  ounces. Horses on pasture should have free access to salt at all times. Work horses should be given salt at regular intervals or it may be mixed in their grain ration at the rate of 1 pound to each 100 pounds of grain.

**Water.**—Good, clean water is needed by horses to aid digestion, to carry off waste products, and to cool the body. Idle horses as well as horses on pasture should have free access to water at all times. The work horse should be given water at least three times daily. In hot weather it is also desirable to give him water in the middle of the morning and afternoon. The average work horse will drink 10 to 12 gallons of water per day and correspondingly more in hot weather.

### COMMON NEBRASKA FEEDS

Feeds for livestock are usually divided into two general classes, the roughages or bulky feeds and the concentrates. Roughages may be further classified into two classes, carbonaceous and nitrogenous. The carbonaceous roughages are those that are high in carbohydrates and low in protein, and the nitrogenous roughages are those that, besides being fairly high in carbohydrates, are also high in digestible protein. The concentrates are classified as low-protein and high-protein. The low-protein feeds include most of the cereal grains and the high-protein concentrates include most of the commercial by-product feeds such as the various oil meals, shorts, bran, and so forth.

#### Concentrates

**Oats.**—For a great many years oats have been considered the standard grain for horses, being equally suitable for foals, brood mares, work horses, and stallions. They are fairly well balanced, containing about the right proportions of protein, carbohydrates, and fats to take care of the requirements for the various classes of horses, and the hulls give the grain ration sufficient bulk to insure complete digestion. Grinding the oats is an unnecessary expenditure, because it increases efficiency of utilization only five per cent. This is more than offset by the expense of grinding unless the price of oats is very high. Oats can be fed as the entire grain ration or in combination with other grains very satisfactorily. The feeding value of oats varies according to the weight per bushel, heavier oats being much more valuable than light oats.

**Corn.**—Throughout the Corn Belt corn ranks second to oats as a concentrate for horses. Corn is not considered as safe a feed as oats, even though one pound of corn actually furnishes more energy than one pound of oats. If corn is fed in the summer, it should not comprise more than one-half the grain. Some horsemen feel that corn "burns out" a horse if



fed in large quantities as the sole concentrate, especially in warm weather. Corn is a heavy feed and therefore care must be taken not to overfeed it. It will take 15 per cent less corn than oats to furnish horses the same amount of energy. In order to get the best results when feeding corn, some nitrogenous roughage such as clover or alfalfa should be supplied. When hays from grasses are fed with corn, some protein supplement should be added. A grain mixture consisting of half corn and half oats makes an excellent combination for work horses. If corn is fed to foals, brood mares, and stallions, it should be fed in conjunction with the more bulky concentrates such as oats or bran. Corn can be fed on the ear, shelled, or coarsely ground and also in the form of corn-and-cob meal. This latter method makes the corn a much safer feed because of the bulkiness. Only good corn free from smut and rotten kernels should be used.

**Barley.**—The best results are obtained from feeding barley when it is mixed with oats. Barley is similar to corn but is not as good as corn and oats. In one trial at the Wisconsin Experiment Station it was found that, pound for pound, barley was worth ten per cent more as a feed for work horses than oats, but at the North Dakota Station barley did not prove so efficient. Because of the hardness and smallness of the kernel, barley should be rolled, crushed, or coarsely ground for horses. If the barley is ground too finely the meal forms a pasty mass when mixed with the saliva in the mouth and thus becomes hard to digest. Because barley is not as bulky as oats, there may be slightly more trouble from colic when it is fed. However, it is generally considered a fairly safe feed.

*These nine purebred yearling fillies at the College of Agriculture are eating sorghum fodder.*





**Wheat.**—Wheat should not make up more than half the total grain ration for horses. The price of good wheat usually prohibits its use as a horse feed. Frosted or damaged wheat, if not moldy, can be fed, and when price permits good wheat may be fed with economy. Wheat should be rolled or crushed and fed in moderate amounts or as only part of the grain ration. Like barley, wheat should only be cracked or coarsely ground. Wheat gives best results when supplemented with a nitrogenous grain or hay.

**Rye.**—Rye can be used only in a limited way for horses. It should be coarsely ground and mixed with some bulky concentrate and should not exceed one-fourth of the grain ration. Rye is not especially palatable to horses and is liable to produce some digestive disorders when fed as the only grain or if the change to rye is made too abruptly.

**Grain sorghums.**—The grain sorghums have increased in importance in Nebraska during the past few years. They make a very satisfactory grain for horses, being between 90 and 95 per cent as valuable per pound as corn. Grain from the sorghums is small and hard and therefore should be coarsely ground and if possible fed with bran or some laxative type of feed, for it tends to produce constipation. The entire grain sorghum head may be ground, and because of its more bulky nature it makes a very desirable grain feed for horses. The entire sorghum forage plant may be fed in the form of fodder, thereby giving the horses concentrate and roughage together.

**Cane molasses.**—Cane molasses or "blackstrap" is well liked by horses and acts as an appetizer in their diet. It can be fed alone or may be mixed with the grain ration. Sprinkling diluted molasses over the roughage will induce horses to clean up coarse unpalatable roughages. Blackstrap contains practically no protein and consequently should be fed in combination with some protein-rich concentrate. Upwards of five to seven pounds of molasses may be fed per head daily. Blackstrap is not laxative like beet molasses. Molasses has not proved to be a satisfactory hot-weather feed because of flies.

**Beet molasses and other beet by-products.**—Beet molasses should be fed only in limited amounts because of its laxative effect on horses. When not fed in excess it has given very good results. It may be thinned with warm water and fed with straw, fodder, or dried beet pulp. Straight dried pulp is unpalatable to horses but when molasses is mixed with the pulp horses will consume limited amounts. Since molasses is high in carbohydrates and low in protein it should be fed only when low in price.

Wet pulp is not desirable for feeding work horses although it can be fed to idle horses at the rate of 20 to 40 pounds per day. Feeding larger quantities may prove injurious.

Beet tops may be used as part of the ration for fattening idle horses in the fall. Horses are often pastured on beet tops in the sugar-beet areas.

#### Protein-rich Concentrates

**Wheat bran.**—Wheat bran is a bulky protein-rich concentrate that is very valuable for horses, especially when fed as a part of the grain ration.

It has a mild laxative effect on horses. Usually bran is too high in price to be fed instead of home-grown grains. It is an especially good concentrate for mares, a few days before and after foaling, for growing foals, and, as part of the grain ration, for stallions. Bran seems to keep horses in a thrifty condition and causes the hair to shed. The practice of cutting the grain ration in half and feeding one-half bran on days the horses are not working helps to prevent colic and azoturia.

**Wheat shorts.**—Although shorts furnish more nutriment than bran, they are not as desirable for the horse because of their heavier character. They should make up not more than one-fourth of the grain ration as they tend to produce colic. This danger seems to be greater with some horses than others.

**Linseed meal.**—Linseed meal is a high-protein feed that should not be fed alone but in conjunction with the farm-grown grains. One to one and one-half pounds per day mixed with the grain ration is sufficient. It is not very palatable but seldom is refused when mixed with the grain ration. It is somewhat laxative and can be fed with the more constipating feeds such as straw, prairie hay, and fodder. It is an excellent feed for getting thin horses ready for spring work. It acts as a tonic, causes early shedding of the winter coat, improves the appearance, and puts on fat.

**Cottonseed meal.**—Cottonseed meal although not as palatable as the grains is one of the cheapest and best sources of protein. It is not as laxative as linseed or soybean oil meal, and best results are obtained when it is fed with the more laxative feeds. When cottonseed meal is added to a ration low in protein, it is worth approximately twice as much per pound as corn. A good rule to follow is not to feed more than one to one and one-half pounds of cottonseed meal for each 1000 pounds of live weight. Only bright high-grade meal should be fed to horses and mules.

**Soybean oil meal.**—Soybean oil meal is practically the same type of feed as linseed meal. It is somewhat laxative and should be fed in about the same proportions as linseed and cottonseed meal. Soybean oil meal, like ground soybeans, acts as an excellent conditioning feed for work horses in the spring because it hastens the shedding of the winter coat prior to spring work.

### Roughages

**Wild hay—bluestem and bluejoint.**—Throughout Nebraska hay from the wild and native grasses is considered the standard roughage for horses. It is one of the safest hays to feed. It is high in carbohydrates and fats, but lacks proteins and minerals and therefore should be supplemented with feeds high in these ingredients. Upland prairie hays in Nebraska are slightly more valuable than timothy, which is the standard roughage for horses in many of the eastern Corn Belt states. It has proved to be an excellent roughage for all classes of horses and is especially well adapted to use when oats make up a good share of the concentrates.

**Mixed hay.**—Mixed hay is produced in the wild-hay regions of Nebraska and is the result of improving native meadows by the addition of



timothy, red top, alsike clover, red clover, and other tame legumes and grasses.

Hay from the mixed-grass meadows is probably the best horse hay that is produced in Nebraska. It is more palatable and higher in digestible protein than wild or timothy hay and is less "washy" than legume hay. It is exceptionally fine with grain rations low in protein.

**Timothy.**—Timothy, like wild hay, is one of the safest hays that can be fed. It is similar to wild hay in its composition and should be fed much the same as wild hay. The best time to cut timothy for horses is when it is in full bloom or the seed is in the early dough stage. At this time it is fairly tender and yet quite high in total digestible nutrients.

**Alfalfa.**—Alfalfa is probably the most palatable of all hays for horses. It is high in digestible protein and contains some minerals. It is especially well suited to feed with corn, barley, and oats, because it is more laxative than the carbonaceous hays and also because of its high digestible-protein content. Best results probably will be obtained when alfalfa hay makes up about half the day's hay allowance. The alfalfa allowance should be limited to 1 or 1.2 pounds per 100 pounds of live weight daily for horses doing medium to hard work. Horses that are allowed to eat good-quality leafy alfalfa at will are likely to gorge themselves, thus receiving an excess of highly nitrogenous material.

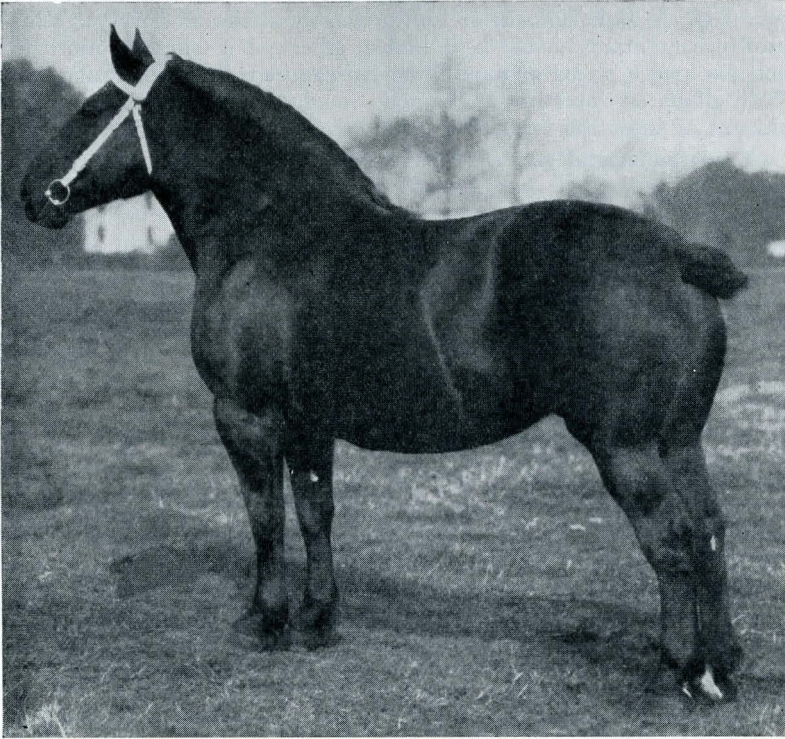
Alfalfa hay is looked upon with considerable favor when used as part of the roughage for the feeding of brood mares and growing colts. It has a tendency to increase the milk flow of the mares and helps to build bone and muscle in the colts. Alfalfa should be free from dust and mold and should not be cut until it is in full bloom. Hay that is dusty often causes heaves, and immature hay is generally too laxative for horses. Well-cured, mature, first-cutting alfalfa is preferred by most horsemen when it is fed as the sole hay ration.

**Clover hay.**—Hay from medium red clover has about the same feeding value as alfalfa and is the same type of feed. It is palatable, fairly high in protein, and slightly laxative. Like alfalfa it is well suited for horses that are receiving considerable corn, barley, or oats. Clover should be fed at about the same rate as alfalfa, care being taken not to overfeed. Dusty clover should be avoided if possible. If clover hay becomes dusty it should be sprinkled before it is fed. On wet or poorly drained soils alsike clover does better than red clover.

**Clover and timothy.**—Clover and timothy grow well under the same conditions; therefore the two feeds can be grown together to make an ideal horse hay. The two should be sown so that the yield will be half timothy and half clover or 60 per cent timothy and 40 per cent clover. Hay from this mixture is much safer than clover alone, is better balanced than timothy alone, and is an excellent roughage for all classes of horses.

**Sudan, brome, and millet hays.**—Throughout Nebraska Sudan is cut for hay as well as being used for a summer pasture for horses. It makes a hay that is palatable to horses but it is of slightly less value than timothy

and wild hay. If it is to be used as hay it should be sown moderately thick and cut before it is too mature. Brome hay may be grown and used as a horse hay in the northern part of Nebraska. Special care should be taken in curing to avoid mold. It compares very favorably with timothy as a hay for horses. Millet hays are satisfactory for horses if they are cut before they are mature and then fed as only half the roughage. If fed as the sole roughage over a long period of time millet hay may cause serious



*Well-balanced rations produce growth, good flesh, and bloom. Carmona V, voted to be the ideal type of Percheron mare by Percheron breeders.*

lameness and swelling of joints. It also often causes increased action of the kidneys.

**Cereal hays.**—Hays from the grains such as oats, barley, and wheat are quite extensively used in the Rocky Mountain and Pacific slope states. They are palatable and compare favorably with timothy and wild hay in feeding value. Some protein-rich feed should be fed with cereal hays. If there is a considerable amount of grain in the hay the allowance of con-



centrates should be reduced accordingly. Grains grown for hay should be sown at the usual rate or a trifle more heavily and the hay should be cut when the grain is in the late-milk or early-dough stage.

**Straws.**—Straws from the small grains are useful for wintering horses. Little if any straw should be fed to horses at work. In feeding value the straws rank in the following order: oat, barley, wheat, and rye. Oat straw is more palatable and higher in digestible nutrients than the others, but all of them are low in protein, high in fiber, and somewhat constipating if fed as sole roughage. Horses should not be wintered with straw as the sole feed. A slight amount of hay, preferably alfalfa or clover or a high-protein concentrate, should be available; otherwise it takes too much feed and too long a period of time to get horses in condition for spring work. With alfalfa or clover hay as the main roughage for work horses, a small amount of straw can be used to good advantage.

**Corn fodder and stover.**—Thickly grown fodder or bright well-cured stover are very good roughages for horses. Fodder contains the grain, while stover has the grain removed and does not have as high a feeding value. Good corn forage is an excellent substitute for timothy in feeding idle horses, brood mares, or growing horses. The practice of turning idle horses into the cornfield after the corn has been harvested is followed by many farmers. Horses will winter well on cornstalks when they also have free access to a straw pile. There is some danger of cornstalk poisoning, however, and to avoid this the corn can be cut, shocked, and fed after the fodder has properly cured.

**Sorghum fodder.**—Sweet sorghum fodder, if properly cured and not too coarse, is well liked by horses and is superior to corn forage. Some horsemen like it as well as wild hay. In a recent experiment conducted at the University of Nebraska one lot of yearling colts fed sorghum fodder *ad lib* as their sole dry roughage gained more rapidly and made more efficient gains than a lot of yearling colts fed good Nebraska wild hay *ad lib*.

Care should be taken to cure sorghum fodder properly, and it should be stored where it will not deteriorate or become moldy. Decayed or moldy sorghum forage is very dangerous for horses. Fodder from the grain sorghums is not as palatable as fodder from the forage sorghums, but may be used with good results.

**Corn silage.**—Corn silage may be used as a part of the wintering ration for work horses, brood mares, and growing colts, provided it is of high quality and free from decay and mold and not frozen. Corn silage is a very bulky feed and therefore should not be used to replace more than half the hay ration. Idle horses may be fed as high as twenty pounds per head daily, but horses at hard work should have very little silage in their ration. Corn silage is low in protein and low in minerals and therefore should be supplemented with some protein and mineral feeds.

**Sorghum silage.**—Silage from the forage sorghums may be fed to horses much the same as corn silage. It is the same general type of feed, but pound for pound is not quite so valuable as corn silage. It is equally as safe as corn silage, but here again moldy silage should be avoided.

**Pasture.**—Good pasture will maintain idle horses very satisfactorily. However, for horses at hard work pasture without grain is insufficient. Legume pastures can be used as well as the tame and wild-grass pastures, since the horse is not subject to bloat. The practice of letting work stock run on pasture at night and on days they are idle is an excellent method for keeping horses in thrifty condition. Work horses on pasture do not need other laxative feeds in their ration. Wild hay and grains that do not have a laxative effect should comprise the daily ration for work horses that are turned on grass during their idle hours. Work horses should not be turned on pasture until the grass has sufficient growth to be well past the washy stage.

### FEEDING WORK HORSES

There are three phases that should be considered: first, the feeding of the idle work horse during the fall and winter; second, preparation of the work horse for spring work; and third, the feeding of the working horse through the busy season or spring, summer, and early fall.

**Feeding idle horses.**—Idle horses should be fed as economically as possible, and yet be kept physically strong and rugged. Often it is false economy to cheapen the winter feed so much that by doing so a lot of high-priced feed and too long a time are required to prepare the horse for spring work.

Cheap roughages may be utilized during the winter. The idle horses may be turned into a cornstalk field where they also have access to a grain-straw pile. Winter pasture or range should be used to its fullest extent to supplement the straw pile or cornstalk field. Corn silage may also be used to a limited extent. It should be kept in mind that in some years there is danger from forage poisoning from cornstalks, and it is always advisable to use precautions. Only a few horses should be turned out at a time and they should not be left in the field too long at first. Each day the time they are allowed to remain in the stalk field may be lengthened until they are thoroughly used to the change of diet. Horses that have access to winter-wheat pasture in conjunction with the dry roughages will winter much better than upon the latter only.

The condition of the horses should be watched during the winter. If they begin to lose too much weight, become constipated, and are not doing well some nutritious hay such as alfalfa should be added to their ration. In case there is no alfalfa available one pound of cottonseed, linseed, or soybean meal per head daily should be fed to take care of the protein requirement.

If work horses have been wintered outdoors on cheap roughages they will probably be shaggy and only in fair condition when they are brought in for spring work. Some may winter better but even these are probably weak and should not be put right into hard work. Horses should be gaining in weight for a few weeks before spring work begins. They should be brought in and gradually accustomed to grain for at least two weeks



before spring work starts. A little bran or linseed meal in the ration aids the horse in shedding his winter hair and keeps his digestive tract in good order. The effect of good conditioning in early spring has much to do with the general condition of the horse throughout the entire summer.

**Summer feeding for idle horses.**—In the summer time idle work horses should be turned out on good pasture if it is available. This keeps them in better condition and reduces the feed cost. When this practice is followed and the pasture is good, very little hay is needed. On Sundays and holidays the horses can be kept on pasture. However, they should receive one feed of grain on these days when they are doing medium to hard work. Home-grown feeds should be used as much as possible in order to keep down the cost. The following mixtures by weight are a few satisfactory rations for summer feeding:<sup>2</sup>

- |  |  |
|--|--|
| (1) Oats<br>Prairie hay and pasture  | (5) Cane molasses four parts<br>Oats four parts<br>Cottonseed or linseed meal one part<br>Prairie or timothy and clover hay,<br>some pasture |
| (2) Oats one part<br>Shelled corn one part<br>Prairie hay and pasture                                  | (6) Oats three parts<br>Wheat one part (coarsely ground)<br>Either prairie or alfalfa hay with<br>pasture                                    |
| (3) Oats one part<br>Shelled corn one part<br>Cane molasses one part<br>Alfalfa hay and pasture        | (7) Oats three parts<br>Barley two parts (coarsely ground)<br>Good hay and pasture   |
| (4) Shelled corn five parts<br>Oats three parts<br>Cottonseed meal one part<br>Prairie hay and pasture | (8) Oats two parts<br>Rye one part (coarsely ground)<br>Prairie hay and pasture  |

Other than for pasture these rations are also satisfactory for winter feeding. Bran can be satisfactorily worked into all of the above rations if the cost is not prohibitive. It can also be used to replace most of the grain on Sundays when the horses are idle and thus helps to prevent azoturia or "Monday morning sickness" with work horses that do not get any exercise on these days. The hay should be bright and free from dust in order to prevent heaves.

**Feeding the working horse.**—The amount and kind of feed required by the working horse depend upon several factors, namely: (1) kind of feed available from the standpoint of palatability, digestibility, cost, physical effect upon the animal, and balance of the nutrients; (2) climatic conditions (the horse should be fed cooling feeds in hot weather and the heavier feeds during cold weather); (3) amount of work (a horse should receive 2 to 2½ pounds of grain and hay per 100 pounds of live weight when doing medium to hard work).

The following is a guide for the feeding of work horses:

<sup>2</sup> A table on page 43 shows the approximate weight per quart of the various feeds.

TYPE OF WORK	AMOUNT PER 100 POUNDS LIVE WEIGHT	
	ROUGHAGE	GRAIN
Idle	$\frac{1}{2}$ lb. hay plus cheap roughage	.....
Light work (2-3 hrs. per day)	$\frac{1}{4}$ to $1\frac{1}{2}$ lbs. hay	$\frac{1}{3}$ to $\frac{3}{4}$ lb.
Medium work (4-6 hrs. per day)	1 to $1\frac{1}{2}$ lbs. hay	$\frac{3}{4}$ to 1 lb.
Hard work (8 or more hrs. per day)	1 lb. hay	1 to $1\frac{1}{4}$ lbs.

These amounts should be used only as a guide and do not assure that all horses so fed will react the same. The kind and quality of the hay will also help determine the amount of grain feeding necessary.

A rule that can be followed for the division of the three daily feeds is as follows:

Morning.....	$\frac{1}{3}$ of the grain ration and $\frac{1}{4}$ of the hay
Noon.....	$\frac{1}{3}$ of the grain ration and $\frac{1}{4}$ of the hay
Night.....	$\frac{1}{3}$ of the grain ration and $\frac{1}{2}$ of the hay

Most of the hay should be fed at night when the horse has plenty of time to eat and digest the roughage. Horses can be overfed on roughage; they have small stomachs which when overloaded and distended crowd the lungs and cause digestive disturbances, and labored breathing and a tendency to tire quickly may be the result.

**A method for saving hay and grain.**—On ranches where there are a number of extra work horses the procedure of working each horse two days a week and letting all of the horses run on pasture when not working will save hay and grain. Horses handled in this manner do not need any grain. Hay can be fed to them at noon on the days they work. This plan works satisfactorily where there are a number of mature horses and also a number of colts that are being broken. Colts should be worked a little each day during the first part of the training period, after which they should be worked only half a day every other day. An alternative to this plan is to work the mature horses every day but only half a day at a time. The horses can be changed at noon. By following these practices, on ranches where colts can be raised cheaply, the colts may be broken every season and as they mature the older, better-broken horses can be marketed. Thus the rancher realizes some revenue from the horses each year and still has enough available to do all of the ranch work.

**Watering.**—The proper time to water work horses has always been a debatable subject. The common practice in America is to water, feed hay, and then grain. The English method is to water, feed grain, and then hay. The German method is to feed hay, water, and then grain. As a matter of convenience, the American plan is best. Horses that have been working hard and are hot should be cooled off for thirty minutes to one hour before they are watered or fed grain. A horse that has been "winded" should not be watered until he is breathing normally. A full drink of cold water when the horse is overheated may cause founder. An overfeed of grain, especially corn, wheat, or rye, may also cause founder. A home remedy for mild cases of founder is to stand the horse in a stream of water until the fever has been reduced. If given the opportunity many horses will go to a stream and stand in it of their own accord until they get relief.



## GENERAL MANAGEMENT OF WORK HORSES

**Care in the stable.**—Farm horses are stabled as a matter of convenience to the farmer rather than for the comfort of the horses. Except in very severe weather the horse is better off in a good pasture or a feed lot where he can eat and drink at will. If stabled the stall should be dry, well-bedded, and large enough for the horse to lie down in comfort. Two horses that will stand together have more room in an eight-foot double stall than one horse in a four-foot single stall. Single stalls for horses over 1400 pounds should be five feet wide. One or more box stalls twelve to fourteen feet square are very convenient for foaling stalls and may be used as a double stall for a span of horses. Feed boxes for grain should be separated by a partition high enough so that one horse cannot steal grain from another. Divisions between stalls should be made of heavy two-inch planks or four-inch poles. The floor of the stall may be clay, a mixture of clay and gravel, three-inch planks, poles, or concrete covered with two-inch planks. Horses should not be required to stand or lie on the bare concrete. The stable should be considered as a shelter from storm rather than a place to keep the horses warm. An excess of ventilation is better than not enough.

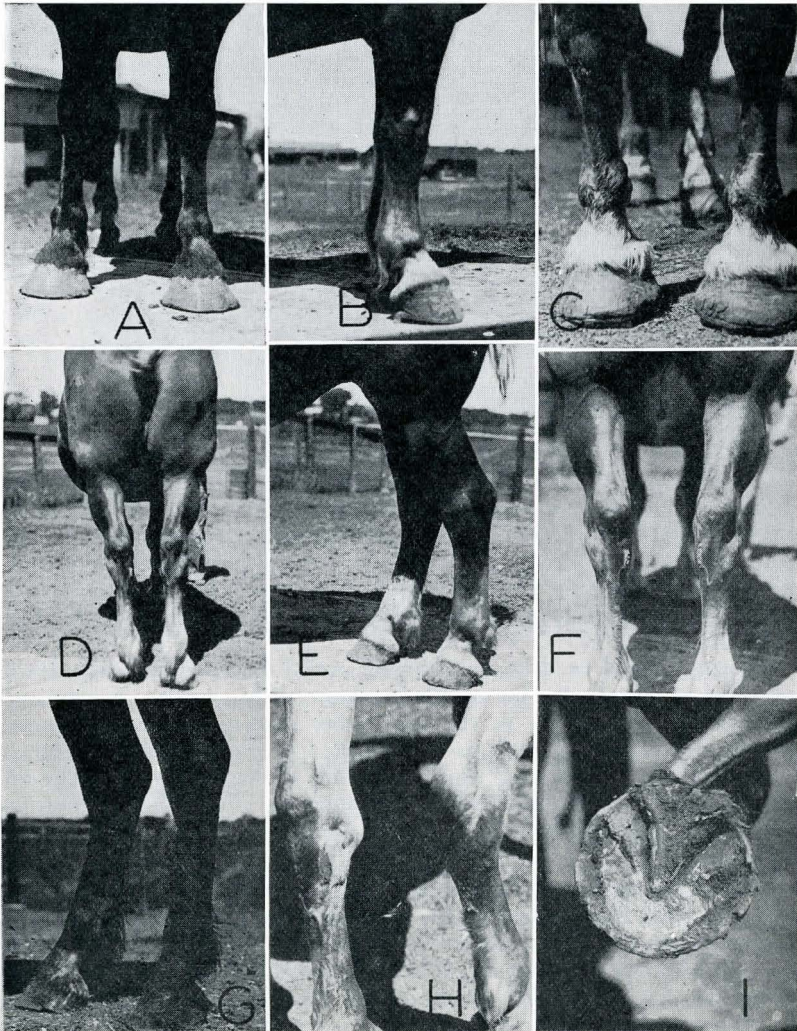
Stalls should be cleaned regularly and bedding freely used. Clean stables mean fewer flies. Horses required to stand in filth often have thrush and other foot troubles.

**Fitting the harness.**—Collars should be properly fitted in order to prevent sore shoulders and necks. Horses with straight shoulders and wide necks should be fitted with a half or full sweeney, while horses with well-shaped shoulders can be fitted with regular or full-faced collars. The collar should not be too short. When set on the neck there should be  $2\frac{1}{2}$  to 3 inches of space between the bottom of the collar and the lower part of the neck. This depends somewhat upon the way the horse carries his head. A collar of this length will not choke the horse when he is required to make a hard pull. A collar that is too short often causes sore necks. The collar should fit fairly snug along the side of the neck. Some adjustments can be made with the hames, if the collar is too wide.

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*A good drafter must have the right kind of sound feet and legs. (A) Front view of a good set of front legs; note the large foot and clean hoof head. (B) Side view of front legs; note the set of these legs, the quality and flatness of the cannon, and shape of the foot. (C) Bad front legs; note the short pasterns and how his feet toe in; sidebones are very evident. (D) Rear view of good hind legs that exhibit lots of quality. (E) Side view of a hind leg that shows the proper set to the leg and hock. (F) Close-up of a good hock; note the size, shape, and quality of the joint. (G) Bad set of hind legs; sickle hocks that are too small, cannon too small and round. (H) Poorly set, unsound hock; note the bog spavin. (I) The bottom of a good foot; note the roundness and size of the foot, also the width of the heel.*

A collar that is too wide often galls the shoulder; too narrow a collar may gall the side of the neck. A collar that fits well on the fat horse generally is too large when he is worked down. This should be watched and adjustments made. The use of collar pads should be avoided but when necessary the lighter-weight kind with an oilcloth front is preferable. The face of the collar and the pads should be thoroughly cleaned each day. Hames should be properly fitted the same as the collar; they come in sizes as do collars. A twenty-two-inch collar demands a twenty-two-





inch hame to make a proper fit to the horse's neck and shoulder. It is never advisable to use a hame that is too long or too short for the collar, as it is impossible to get a good fit with such a combination.

The harness should be in good condition with no rough spots that might chafe the horse. It should be fitted well but not too tight. Once a year the harness should be taken apart, repaired, and then washed thoroughly and oiled with neat's-foot oil. Blackened oil may be purchased from harness shops or hardware stores. Avoid the use of mineral oils, which have a tendency to dry out the leather.

**Care of shoulders and necks.**—Every precaution should be taken to prevent sore shoulders and sore necks, as a horse does his best work when he is working in perfect comfort. It is just as important to properly harden the horse's shoulders and neck in the spring as it is to feed the horse properly in preparation for spring work.

Adjustment of the collar, hames, and harness so that they fit the horse properly are the first steps to take in keeping the shoulders sound. Secondly it must be remembered that the muscles and skin of horses that have been idle are tender and soft from lack of use. Don't work them too hard at first. The teamster should stop his team occasionally and raise the collars from the horses' shoulders. The mane should be pulled out from under the collar. Washing the shoulders and necks with a cold salt-water solution in the evening hardens the shoulders and necks much more rapidly.

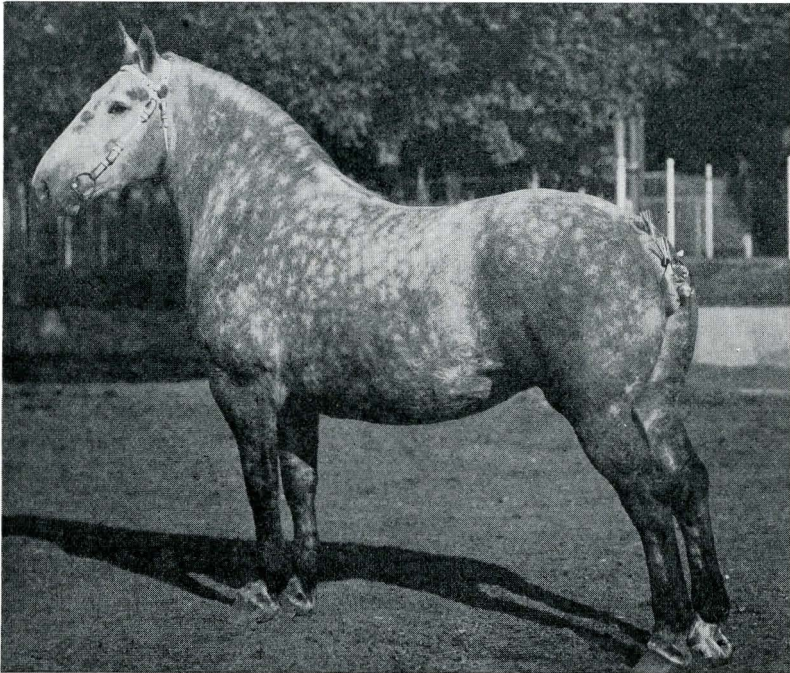
**Care of the feet.**—Generally range horses keep their feet well worn down and need no special care. Farm-raised colts' feet should be kept well-trimmed so that they will not grow out of shape or develop cracks or flat hoofs. This trimming should be done with a pair of hoof nippers and a rasp. Sometimes the feet are trimmed with a long-handled chisel and hammer while the foot is in normal position. The objection to this method is that the operator is unable to see what he is doing. The trimming should follow close to the sole of the foot, which is best seen when the foot is held up. It is better to trim with a chisel than to let the feet grow long.

Shoeing should be done only to protect the foot from wearing down until sore or to give the horse better traction. When horses are shod the shoe should be made to fit the foot rather than the opposite. Horses worked on gravel roads will have to be shod to protect the feet. Horses working in the field at such work as plowing or harrowing are better off with no shoes. Heavy-calked shoes are often the cause of hoof injuries, especially in big-team hitches where the horses may trample one another in turning.

**Care of the teeth.**—The colt usually has no trouble with his teeth. The first milk teeth are replaced by the permanent teeth at two years of age. At two to five years the teeth should be examined occasionally to see that the milk teeth are dropping out before the permanent teeth appear. These milk teeth that do not shed at the proper time should be pulled so that the permanent teeth will come in straight and in the proper place. Molars

or jaw teeth that do not shed at the proper time may become sore or stand up above the others and prevent proper mastication of the feed. These back teeth are hard to examine without a mouth speculum. Sometimes abnormal teeth can be located by feeling along the outside of the jaw. If no speculum is available an examination may be made as follows:

Reach into the mouth just back of the front teeth, grasp the tongue with the right hand, pull it out of the mouth on the left side and thrust



*Percheron mare that exhibits excellent draft type. Note the balance, quality, and good set of feet and legs shown by this mare.*

the left hand into the right side of the mouth until the extreme back teeth can be felt. Then transfer the tongue to the left hand and pull it out on the right side of the mouth; insert the right hand into the mouth on the left side until the rear teeth are reached. Horses' teeth are always rough but an abnormally long tooth can be felt. This method of examining the teeth is rather crude and dangerous to the operator but may be employed in case of emergency. Where the horse's tongue is well pulled out of the mouth it will be between the teeth on the opposite side from the hand so there is very little danger of his biting down on the hand.

Long teeth or exceptionally sharp pointed teeth should be cut off or "floated." Because of the fact that the horse's lower jaw is slightly nar-



rower than the upper, the upper teeth often become shorter on the inside edge. The lower teeth will be worn short on the outer edge. These long edges may become very sharp and cut the cheek and tongue. The sharp corners should be filed down with a protected rasp.

**Grooming.**—Thorough grooming adds greatly to the comfort of the horse. A good curry comb that is of the humane type and a good stiff rice-root brush may be used most effectively in keeping the horse's skin and hair clean and in good condition. The curry comb is used to loosen the dirt, which is then removed with the brush. The curry comb should never be used on the head or legs.

Work horses should be groomed both before harnessing in the morning and after they are unharnessed at night.

**Control of flies and insects.**—Stables should be darkened in the summer time. Gunny sacks may be hung over the windows and placed in strips across the doorways in order to keep the stables cooler and to make flies less troublesome. The strips may be raised at night to allow cool air to blow through the stable.

Fly sprays are very helpful. The following makes an excellent home-mixed fly repellent: two gallons fish oil, one gallon oil of tar, and two ounces crude carbolic acid. This mixture sprayed on horses when they are idle or resting at noon adds considerably to their comfort.

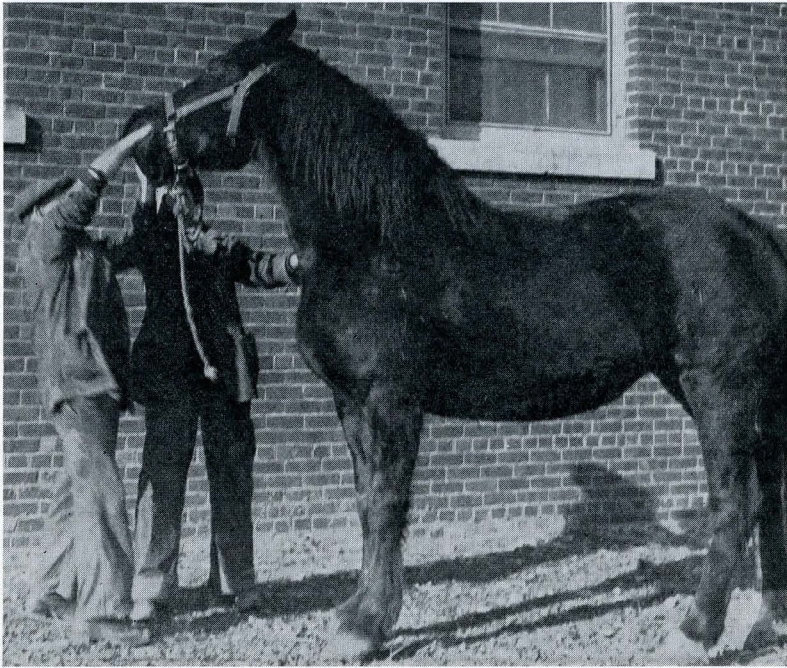
**Internal parasites.**—Internal parasites too frequently retard the development of colts and in some cases even cause death. Even mature horses that are badly infested with bots become subject to frequent attacks of colic. Bots and the ascarids, the larger intestinal roundworm, may be quite easily eradicated by treating the work horses as well as the colts late in the fall or early in the winter with carbon bisulphide. This treatment should be administered by a competent veterinarian who knows just how to give the carbon bisulphide as well as the procedure to follow in preparation of the horses for treatment.

Clean-ground management practices greatly aid in the control of parasites. Insofar as possible the lots and paddocks should be plowed annually and kept clean at all times. Stables, sheds, and box stalls should be cleaned regularly and disinfected with a strong solution of creosote dip. Water tanks should be cleaned regularly so that the horses and colts have clean water available at all times.

**Desirable farm draft type.**—The farmer needs a horse that is alert, capable of pulling a load at a good fast walk, and able to stand hard work in hot weather. A horse that stands from 15 to 16 hands in height and measures from 78 to 83 inches around the girth, with a body length of about 40 inches, seems to be just about the ideal type of horse for the average Corn Belt farmer.

The draft horse should have quality and finish. He should have a smart, alert eye, head of medium size that is well chiseled in appearance, a neck of medium length that blends smoothly into a good sloping shoulder that is smoothly and heavily muscled. He should have a strong, short back, a deep, well-rounded rib, a short coupling that blends smoothly into

well-laid-in hips, and a long, heavily-muscled croup that is not too sloping. His underline should be long, his chest wide and deep, and he should have plenty of width through his stifles and quarters. The old adage "No foot, no horse" is just as true today as it was years ago. The draft horse should have a leg under each corner, large, clean-cut joints, a clean, flat bone with plenty of size, a short cannon and long, sloping pasterns. The hoof head should be smooth, the foot large, deep, round, and of proper texture. He should stand squarely on his feet and legs at all times and should



*Treating the work horse for bots and worms. A competent veterinarian should be employed to do this operation.*

move with a straight, free, long stride at the walk, and, when trotting, show good height of knee action, plenty of flexion at the hocks, and a strong, bold way of going. The breed of horse is not so important but the type of the horse should always be carefully studied. There are good and bad ones in all of the breeds.

### CARE AND MANAGEMENT OF BREEDING STOCK

**Selection of stallions.**—Since the purchase of a stallion generally requires the expenditure of a considerable sum of money, much care should be exercised in his selection. Not only should the prospective stallion be of



excellent draft type, but he also should be carefully examined for soundness, and his previous training, care, and management should be given consideration. It sometimes is well to obtain the services of a capable licensed veterinarian to inspect the horse for soundness. A buyer can well afford to pay more for a good rugged colt that has been raised in the open and under ideal conditions than for a pampered, poorly raised colt. It also is a known fact that older stallions that have been carefully fed and handled, properly exercised, and not overused, usually remain fertile to an advanced age. It is not uncommon for a stallion that has been carefully handled to remain fertile and get a large colt crop up until he is twenty or more years old.

At the present time a stallion of medium type weighing between 1900 and 2000 pounds in average condition, seems to be of the most acceptable size and weight. He should show boldness and masculinity in the head and neck and possess lots of character. The good, strong-headed, well-balanced stallion that is of the right type and can move with alertness and boldness of stride usually proves to be a strong sire. It is very essential that the stallion show more bone substance and boldness than mares.

**Feeding and management of stallions.**—The potency of a stallion is directly dependent upon the care, feed, and management he receives in the off-season as well as during the breeding season. Stallions vary in their capacity for turning off mares. The vigorous, healthy two-year-old should be able to take care of 12 to 15 mares, provided of course that not many of the mares have to be returned for the second and third services. The two-year-old should not be allowed to service more than two or three mares per week. A three-year-old colt should be able to handle around 30 to 35 mares, the four-year-old 50 to 60 mares, and the mature horse 80 to 100 mares in a four-months season. It is not advisable to allow a mature horse to service more than two mares each week day and none on Sunday.

Under no conditions should the stallion be allowed to service mares that show any discharge or diseased condition. These mares probably will not get in foal and there of course is danger of spreading infection to other mares as well as the possibility of impairing the usefulness of the stallion. Other points to consider in caring for stallions are the following:

Stallions should receive plenty of exercise. Box stalls should be connected with paddocks where the stallion may run at will.

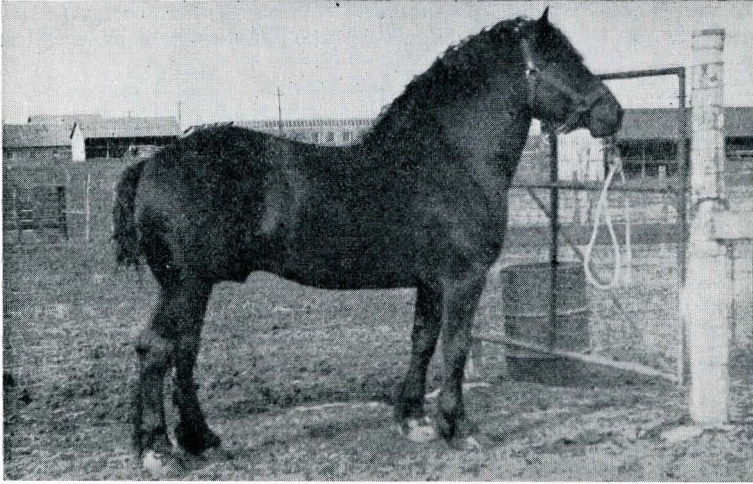
Paddock fences should be about seven feet high. A strong pole fence is one of the best types, as it is strong yet allows the stallion to see out at all times, which encourages him to take more exercise.

Stallions kept in dark box stalls often become ill-tempered and difficult to handle.

All breeding should be done in the same conveniently arranged place. To change the breeding place from time to time is a poor practice.

Stallions should be fed and groomed regularly—and carefully.

A good rule to follow if the stallion begins to get sluggish, or too fat,



*Koncalypse, the University of Nebraska Percheron herd sire, takes his daily exercise in a large stallion paddock. Note the height of the fence.*

and is not settling the mares, is to cut the grain ration in half and double the exercise.

The stallion should be fed a ration rich in protein and mineral at all times. When in heavy service, the stallion needs plenty of nutritious well-balanced feeds. Oats are an excellent grain to be used as the main concentrate. Bran and linseed meal also are very suitable for feeding stallions. Corn, wheat, and barley can be used to a limited extent but are too fattening to feed as the sole concentrate.

The roughage fed should be good, clean, bright hay. Prairie or timothy hay is safe, but such hays are not very nutritious. Alfalfa and clover are both palatable roughages but should not be fed in too great quantities. One of the most satisfactory roughages is Nebraska mixed hay (page 12). The amount of hay and grain fed depends upon the age, size, and exercise of the horse. During the breeding season these points, plus the number of mares being served, should be considered.

A general rule to follow is to feed  $\frac{3}{4}$  to 1 pound of grain and 1 to  $1\frac{1}{4}$  pounds of hay for each 100 pounds of live weight during the breeding season. When not in service he should be fed just enough to keep him in a vigorous, healthy condition. The following is a suggested ration for a stallion not in service:

Oats 8 parts  
Bran 1 part

Corn 2 parts  
Mixed hay or alternate feeds of alfalfa  
and prairie hay

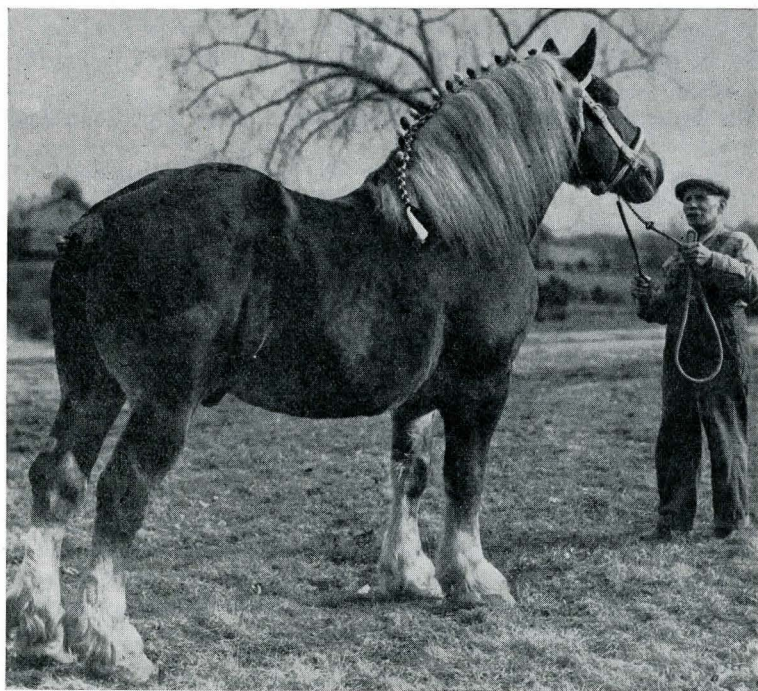
An easy-keeping horse will stay in good condition when fed 1 to  $1\frac{1}{4}$  pounds of hay and  $\frac{1}{4}$  to  $\frac{1}{2}$  pound of the above grain ration for each



100 pounds of live weight. If the horse is being worked, the grain ration must of course be increased. Suggested rations for stallions in service are:

Oats 6 parts	Oats 6 parts	Oats 6 parts
Bran 2 parts	Bran 2 parts	Bran 1 part
Corn 2 parts	Linseed meal 1 part	Corn 1 part
Mixed hay or timothy and clover	Prairie or timothy hay	Alfalfa 50%, prairie hay 50%

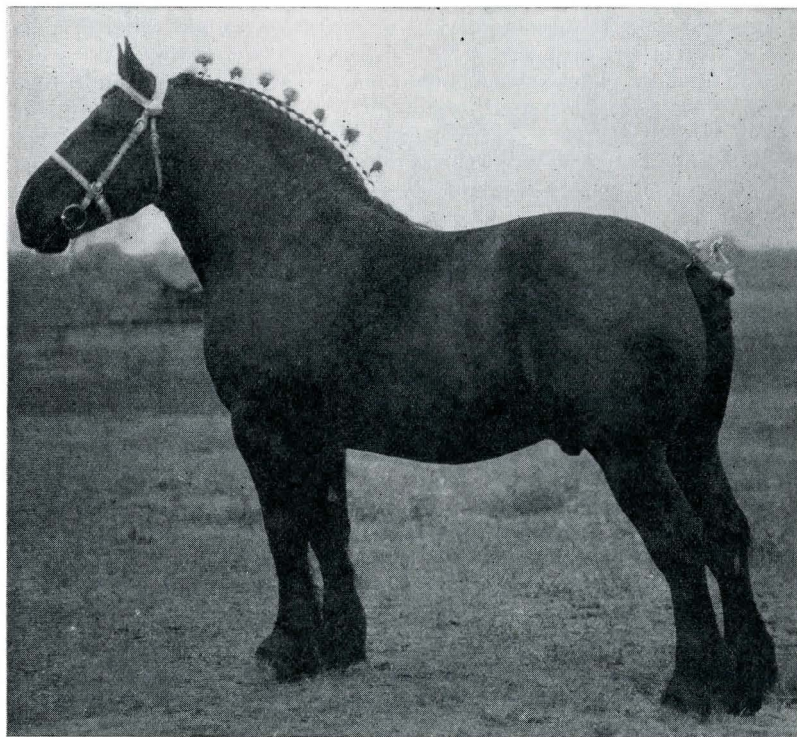
**Range breeding.**—In the West where range breeding is practiced there are numerous systems in use but space does not permit a discussion of the merits of each one. However, one system that has met the approval of many horsemen is to keep the stallion in a corral and during the first part of the breeding season corral the mares once a day. A mare that is in heat can be put into the corral with the stallion and bred. A ridgeling may be used with the band of mares as a teaser. After a period of 20 to 30 days most of the mares will probably have been bred. Then the stallion can be turned on the range with the mares for the remainder of the breeding season. In this way a stallion is able to take care of more mares



*Purebred Belgian stallion of excellent type, Monarque de Thuillies, herd sire, University of Nebraska. A winner at many shows. He shows draftiness, good feet and legs, and quality.*

than if he is turned with the band at the start of the season and it is possible to get a greater percentage of the mares with foal. A mature horse handled in this way should be able to take care of about 60 mares. The horse should not be allowed to run with the mares more than 90 to 100 days. A mature horse that is turned with the mares at the start of the breeding season should handle about 40 to 50 mares.

**Working stallions.**—Where it is at all possible it is an excellent idea to work the stallion. In France practically all of the stallions are satisfactorily worked and are practically as easy to handle as mares and geldings. They should be broken at two or three years of age, and if they are carefully handled they will do as much work as any other horse. During the breeding season they should not be worked more than half a day but when not in service they can work full time. The stallion should be worked with a gentle, easily handled mare, preferably one that is in foal. It is usually advisable to use a jocky stick when working the stallion.



*Percheron stallion, Enchanter, bred by the late T. B. Bowman, Boone, Nebraska. Grand Champion at 1937 International Livestock show. Note the draftiness, masculinity, balance, and sound underpinning exhibited by this horse.*



An old pitchfork handle cut into a thirty-inch length with holes bored in each end to permit a strap with snap to be attached makes an excellent jocky stick. This can be fastened from the inside of the stallion's bit to the hames of his mate and keeps him lined up at all times.

**The brood mare.**—The brood mare should be of desirable draft type and should show plenty of femininity and character about the head and neck and also be alert and active but still have a docile disposition. The brood mare should be free of hereditary unsoundness. Blemishes such as wire cuts are in no way detrimental to the value of a brood mare as a producer.

Brood mares should be selected as far as possible from families that are known producers and from dams that regularly produce choice foals. One good brood mare is much more valuable than several of the wrong kind. The upstanding, long-coupled, open-ribbed, shallow-bodied kind of mares have never proved to be satisfactory either as work mares or as brood mares.

**Age and time of breeding.**—Well grown three-year-old fillies may be bred to foal in the spring they are four. Mares bred at this age usually prove to be more regular breeders than mares that remain open until they are six to eight years of age. In some instances a well grown two-year-old may be bred to foal as a three-year-old. However, if this practice is followed, the fillies must be well fed and cared for.

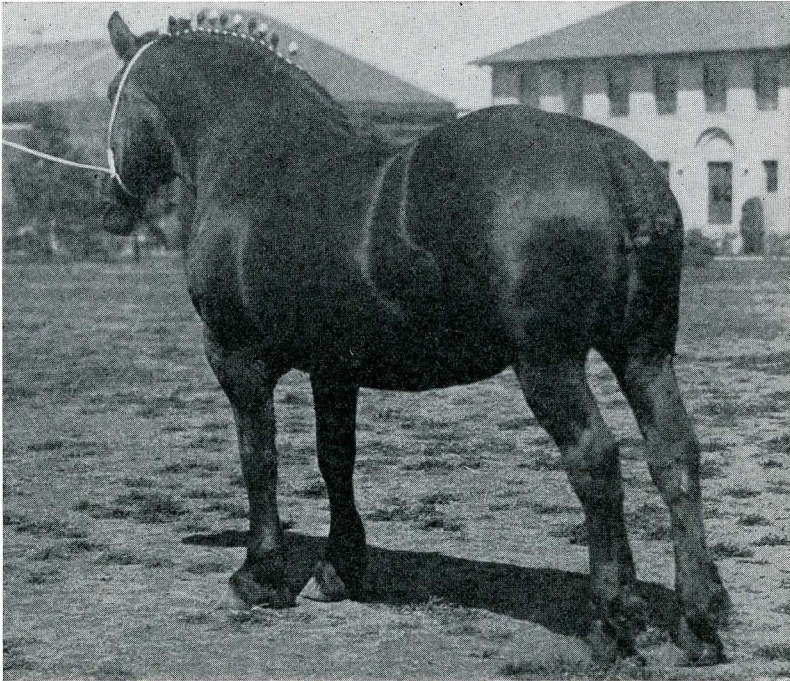
Under range and pasture conditions mares should be bred so that they will foal after the grass has made a good start and before flies begin to bother too much.

Work mares should foal either ahead of spring work or between the time of heavy spring work and harvest. The average gestation period for a mare is 340 days. Mares may vary as much as 40 days either way from the 340, but the majority of them will hit fairly close to the average. The period may be easily remembered as 11 months and 11 days, which generally is quite close to the 340.

Most mares show a heat period nine or ten days after foaling. Farmers who plan to have their brood mares raise a colt each year should practice the policy of breeding the mares back at this first heat period, provided the mares have foaled normally and are in good healthy condition. Otherwise, they should be rebred only after they are again in normal condition. Mares suckling foals are more likely to become settled when bred on the ninth or tenth day after foaling or at the subsequent heat period, than when bred later in the season. The mare should be tried back on the twenty-first, twenty-eighth, forty-second, and sixty-third days after being bred. If she is not "in season" on any of these days, she probably will prove to be in foal. However, if at all possible it is still better to try back the mares twice each week for six weeks after they are bred.

**Feed and management of the brood mare.**—Dry mares should be given the same kind of feed and care as any of the work animals. Mares that are in foal or ones that are suckling foals require some extra attention. It is important that brood mares be properly fed from two to three weeks prior to the time they are to be bred, clear through foaling time. At

breeding time, which normally is in the spring, the mare should be gaining and should be receiving plenty of exercise. If the brood mare is not in a thrifty condition she may not come "in season" as early as is desired. The addition of one pound of linseed oil meal to her grain-hay ration furnishes her with more protein and will cause her to improve in her general condition. If she still does not show a heat period some coarsely crushed wheat may be added to her ration. The wheat germ is high in



*Percheron brood mare from a family of good mares. This type of mare should produce the right kind of offspring.*

vitamin E, which is important for good breeding qualities of the farm animal. Two pounds of the crushed wheat per day should prove sufficient. The range mare will need very little attention except to see that she is on good range and to see that she is bred.

With a little additional feed over that required for her gelding mate, the farm brood mare often takes her share of the load while suckling a colt and carrying next year's colt. From breeding season to one month before foaling, the mare may be handled just the same as geldings or dry mares except when required to do heavy work, at which time she should have sufficient feed to maintain good condition. A month to six weeks before foaling, her work should be lightened slightly and care taken that



she is not required to pull through mud or strain at exceptionally heavy loads. Heavy backing should be avoided. She may be worked at light work up to foaling time.

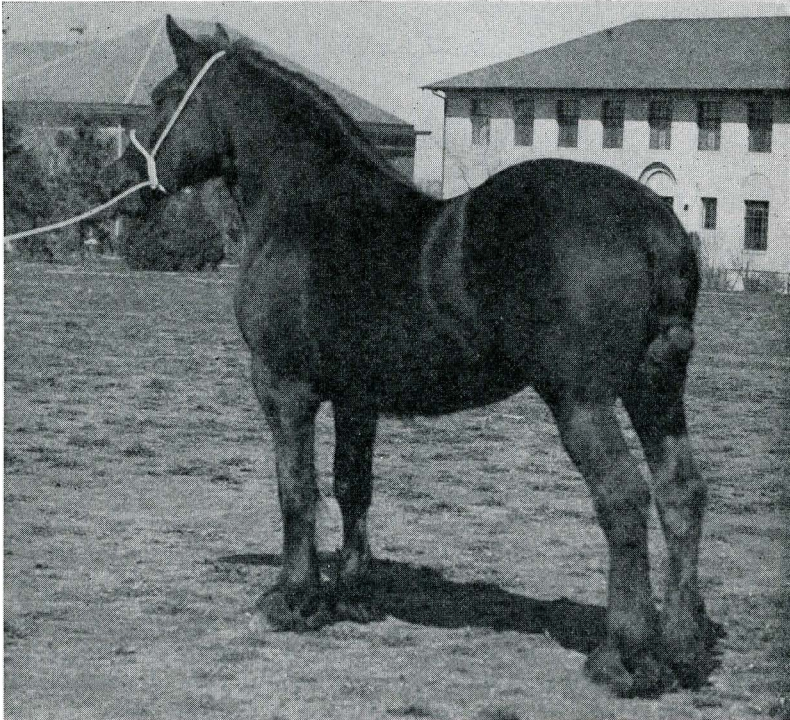
A few days before foaling the mare should be turned in a green grass pasture to foal. If she has been doing heavy work and receiving a heavy grain feed, the grain should be cut down to about half. Oats are the best grain for this season. The day of foaling the grain feed should be a bran mash. If no green pasture is available, or the weather is too severe, the next best place for a mare to foal is a clean, well-bedded box stall. The stall should be thoroughly cleaned and bedded with fresh straw as late before the foal arrives as possible. Mares usually have very little trouble at foaling time if the colt is normally presented. The long legs and long slim head and neck form a cone which dilates the genital passage as the foal is forced forward. Normal presentations occur rather rapidly and unless the mare begins to make some headway with the presentation of the foal within thirty minutes from the time she starts to labor an examination by some competent person should be made. Abnormal presentation may cause trouble. Correction of these abnormal presentations is difficult, and a competent veterinarian should be called.

**Work after foaling.**—The mare may be returned to light work a week after foaling if she is normal. At the end of two weeks she will be ready to take over her regular job but mares suckling foals should be given the light end of the work as far as possible. The colt should not be allowed to follow the mare while she is at work as he is likely to get into machinery or get tangled in the lines and cause no end of trouble. He may be left in a box stall or tied in his mother's stall. Care should be taken that he cannot injure himself in trying to get out.

**Feed and care of the foal.**—The colt born in the green pasture will probably need no assistance. The one born in the box stall should have his navel disinfected with iodine as soon as possible in order to lessen the chances of infection. It is important for the colt to get the colostrum or first milk from the mare because of its purgative effect. If fecal matter does not come twelve to eighteen hours after he is born he should be given one ounce of castor oil and a rectal injection of warm soapsuds. If the mare is to be worked the colt should be kept in a box stall and some grain placed in a feed box that the colt can reach. A mixture of oats and bran makes an excellent concentrate for starting the colt to eat. The oats need not be crushed or ground. The colt should not be allowed to suckle the mare when she first comes in from the field if she is very hot, as the milk might cause colic. In case more than one mare that has a colt is worked, two or more colts can be kept together in a box stall or pole corral to good advantage, as the colts will be less restless than when kept alone.

**Feeding the orphan foal.**—To feed the orphan foal use milk that is low in butterfat from a fresh cow. To one pint of this cow's milk add one-fourth pint of lime water in which one teaspoonful of sugar has been dissolved. Heat the mixture to 100° F. and feed in a sterilized bottle with a nipple. At first feed the colt about one-half pint every hour.

Gradually increase the time between feeds and also increase the milk but be careful not to overfeed. After a few days six feeds per day will be sufficient and later only four. At three to four weeks the adding of sugar can be discontinued but continue with the lime water. At five to six weeks gradually change the colt to skimmilk. When the colt is three



*Yearling filly out of mare shown on page 29. Note the similarity in type, quality, and feet and legs.*

months old he can be given four to six quarts of skimmilk three times each day. Teach the colt to drink from a bucket as soon as possible in order to save labor. After he is drinking from the bucket place a handful of grain in the bottom of the bucket when feeding him milk and he will soon learn to eat grain. It is very necessary to sterilize all utensils used for the mixing of the feed and for feeding the colt.

### CARE OF YOUNG STOCK

Growth is most economically and rapidly made while the colts are young; therefore it pays to feed some grain to colts up until they are 12 months of age.



Whether or not the colts should receive grain prior to weaning will depend on how they are to be handled. If their mothers are being worked they should receive grain. If they and their mothers are on good grass and the mares are not worked, it may not pay to feed them grain. This of course again will depend on how good the feed is. The colts should be "kept growing" at all times. If the grass and other feed are not too good it may be advisable to creep-feed the colts from the time they are one month of age until weaned. A good grain mixture for suckling colts is:

Oats 3 parts  
Bran 2 parts  
Oil meal 1 part

Colts will eat about a half pound of grain mixture for each 100 pounds of live weight while running on good pasture. They should have access to some mineral mixture as well as salt at all times; a mixture that is half ground limestone and half steamed bone meal is satisfactory throughout Nebraska.

**The weanling.**—Colts should be weaned when about five months of age. It is advisable to get the colts on a good grain-and-hay ration prior to the time they are to be weaned, in order to avoid too abrupt a change. The weanling should get around  $\frac{3}{4}$  pound of grain and  $1\frac{1}{2}$  pounds of good high-quality hay for each 100 pounds of live weight. That means the 600-pound weanling should receive  $4\frac{1}{2}$  pounds of grain and 9 pounds of hay per day. Some satisfactory mixtures are the following:

Oats 2 parts  
Bran 2 parts  
Corn 1 part  
Mixed hay or wild hay

Oats 2 parts  
Corn 1 part  
Alfalfa and timothy or wild hay

Oats 2 parts  
Bran 2 parts  
Barley 1 part  
Wild hay or timothy and clover

Oats 2 parts  
Bran 1 part  
Alfalfa molasses meal 1 part  
Wild hay

As the colt increases in size and weight he will need more grain. The average twelve-months-old farm draft colts, if they have been properly grown out, should weigh around 900 pounds. Colts of that size and age should receive about seven pounds of grain and what hay they will clean up each day.

**The yearling.**—Yearlings do not need any hay or grain from the time they are turned out in the late spring until the grass begins to give out. If pasture dries up early in the summer it should be supplemented with one feed of hay each day. Under no conditions should the colts be allowed to lose weight. It never pays to put the same weight on a growing colt twice.

From the time the colts are a year and a half old until they are rising two's, they should be fed all the good hay they will clean up and just enough grain to keep them thriving. If it seems desirable to keep them gaining their second winter they may be fed a half pound of grain per

day for each 100 pounds of live weight. The average farm draft colts will weigh around 1100 to 1200 pounds when they are eighteen months of age and therefore should receive around six pounds of grain per day. They should gain around 200 to 250 pounds the winter they are yearlings.

**The two-year-olds.**—Two-year-olds should be turned on good pasture as early as the grass growth warrants. The fall they are two and a half years old they may be broken and put at light work; thus they become hardened and well broken prior to the time the spring rush starts. After they are two and a half years old they may be fed and handled the same as the work stock, except that when they are broken and worked as coming three-year-olds, they should receive the light end of the work and should receive at least one pound of grain for each 100 pounds of live weight.

Plenty of salt and a mineral mixture should be offered free choice to growing colts at all times.

**Fall colts.**—Some farmers prefer to raise fall colts, because they can work the mares during the rush season in the spring and summer, without having to care for the colts. The mares foal after the harvest is completed and thus raise the colts during the fall and winter when they otherwise would be idle.

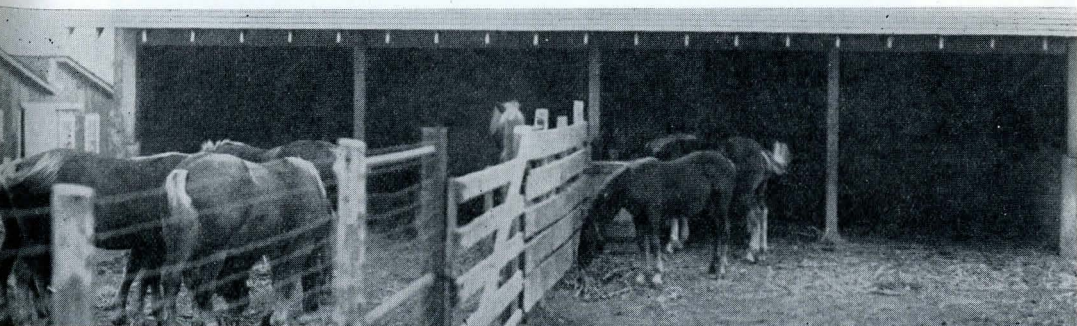
If this procedure is to be followed mares must be fed well during the fall and winter as well as during the summer when at hard work in order to keep up a good flow of milk and still maintain fair condition.

The mares should foal early enough in the fall so that the colts have an opportunity to make a good growth prior to the start of severe, cold weather. The colts should have access to a warm shed and it is advisable to make a creep in the shed where the colts can eat grain and hay at will after they are a month old.

Fall colts, like those foaled in the spring, should be weaned at about five months of age. Colts foaled in September would thus be weaned in February and the mares would get one to two months' rest prior to the commencement of heavy spring work. The colts should be held on grain and hay until pastures have made a good start at which time they may be turned out and from then on handled the same as the spring colts. In most cases these fall colts should not be broken until the fall they are 36 months of age.

**Purebreds.**—In some instances it may be advisable to give the purebred colts a little special attention over the average grade draft colt. It may be

*The open shed and large lot make excellent wintering quarters.*





advisable to feed them a little heavier the second winter and the winter they are coming three's. However, it must be remembered that too much grain is just as detrimental to the colt's development as too little grain; consequently the growing colts should not be fattened.

Young stallions should be separated from the fillies when they are twelve months of age and should be placed on pasture the same as fillies. However, it is necessary to have a good thirty-inch woven wire fence with two to three wires at the top around the stud colt's pasture. This pasture should not be adjacent to a pasture where mares are running. Because these colts are more restless than fillies, it is advisable to feed them a little grain in order to keep them growing well. The fillies will not need any grain and should be handled much the same as ordinary grade drafters during the summer.

Both the stallions and fillies should be fed grain the second winter. These colts generally are larger than grade colts and probably will need more grain. However, one-half pound of grain for each 100 pounds of live weight should prove adequate if they have access to all the good, bright hay they will clean up.

Two-year-olds should be handled the same as yearlings during the summer.

**Castration.**—Grade stallion colts or purebreds that are not good enough to keep for breeding stock should be castrated the spring they are yearlings. The occurrence of infection may be lessened if this operation can be done at a time when the colts may be turned on a good clean pasture prior to the season when flies are prevalent.

**Training farm-raised colts.**—Horses are never too young to break or train. The younger they are, the easier to handle and the less the danger of injury to both colts and handler. Foals whose mothers are being worked should be haltered and taught to stand tied before the mares are returned to work. Foals 10 days to two weeks of age can be taught to lead with very little difficulty. The training they receive at this early age will always be remembered even though they are not handled a great deal from the time they are weaned until they are taken up at three years of age to be broken to work.

Farm-raised colts should be broken the fall or winter they are coming three's. They can do considerable light work that year. Four-year-olds that have been worked as three-year-olds are hardened enough to do heavy work, provided they are given good feed and care. The four-year-olds are shedding their teeth; therefore it is their bad year.

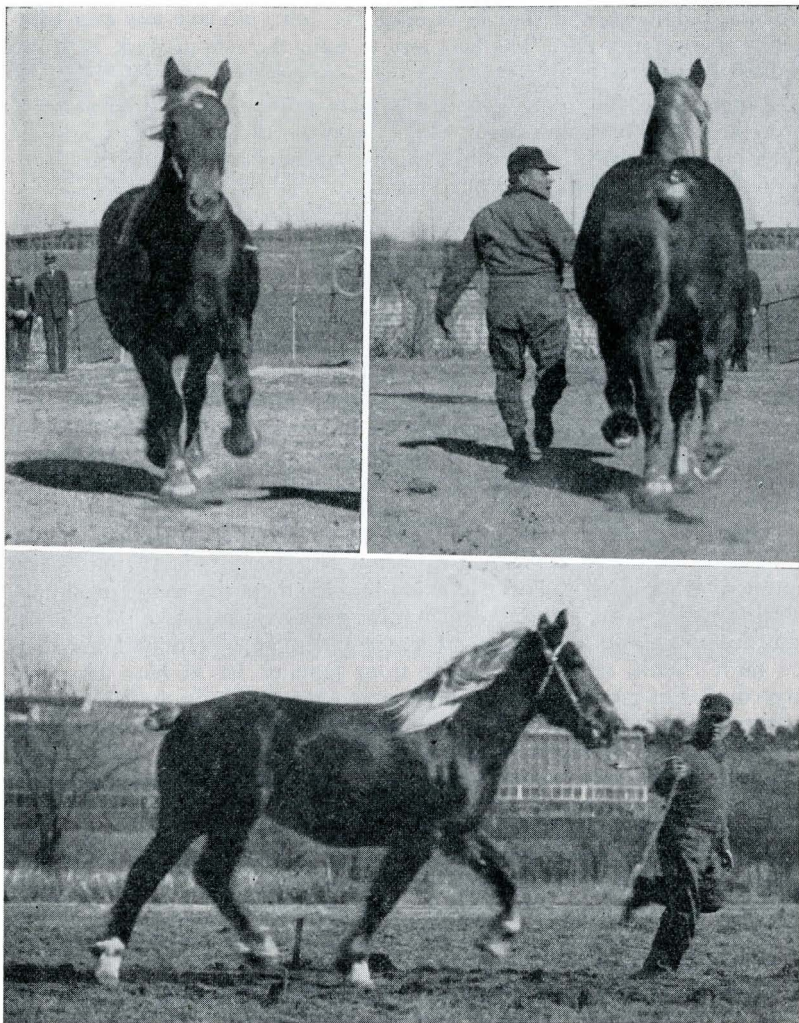
There are many systems and methods of "training" the colt to work. No two colts are exactly alike in disposition and a set method of training cannot be recommended that will prove satisfactory for each and every colt. A few general principles should be followed:

Accustom the colt to the harness, bridle, and bit before hitching him.

Hitch him with a gentle yet active horse the first time.

Tie him solidly to the gentle horse and attach an extra rope or line to the colt's bridle to be handled either by the driver or his assistant.

Hitch him to some such implement as a drag, breaking wagon, dump wagon, or other vehicle where the driver will have the advantage over the colt.



*A well-grown-out Belgian filly. Proper feed and care are necessary to develop correct feet and legs as well as a drafty body. The right kind of feet and legs usually means good action. Note the straightness and length of stride and the height of knee and hock action of this filly.*



Be sure all equipment, such as harness, lines, tie rope, and wagons, are in good shape. A break-down with the colt may prove disastrous.

If the colt is likely to be one that will try to run and is flighty, a "running W" may be used the first time he is hitched.

"Colt training" cannot be rushed. The trainer must exercise lots of patience, judgment, and skill in training the colt. No colt was ever completely trained in a day. The best way to train the colt to work is to use him on regular farm jobs.

**Range colts.**—The range-raised colts may prove to be a little more of a problem to break and train. Like farm-raised colts they should be halter-broken as early as possible. Many ranchers have found it advantageous to halter-break the colts shortly after they are weaned. Those that are halter-broken the first year often prove no more difficult to break than farm-raised colts.<sup>3</sup>

### MARKETING AND SHOWING HORSES

Farmers and ranchers who have surplus horses to sell should fit them properly for the market if the best returns are to be realized. Too many times horses are offered for sale when they are thin and shaggy. Condition helps to minimize the faults of the ordinary horse and accentuates the good points of those of high quality. A fat horse ships better, fills more quickly after a long train or truck ride, and therefore holds his bloom better than the thin horse which more or less "goes to pieces" when shipped.

The market for horses is seasonal. Farm chunks which seem to be in demand at present (1939) usually sell best from January until early summer. This class of horse is a bit heavier than the southern chunk, which usually is in greatest demand from December 1st to March 1st. The eastern chunk, which is a bit larger and more of a draft horse than the farm chunk, sells most readily from January 1st to May 1st. The large drafter of good quality usually moves most readily in the late winter, spring, and early summer. The big, plain, coarse-legged horse that lacks quality and smoothness as a rule goes into logging camps and in some instances to the road camps, should be marketed in the fall and early winter.

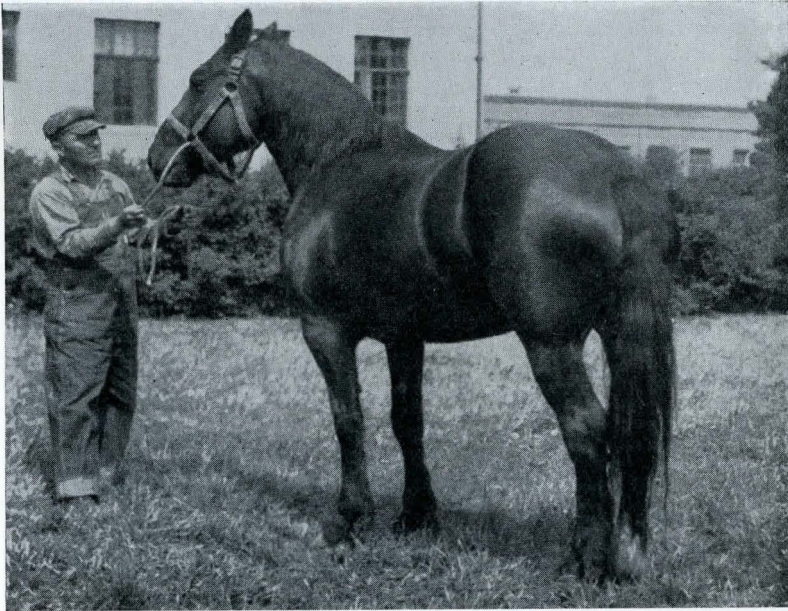
Eastern and farm chunks weighing from 1350 to 1500 pounds will probably continue to be in greatest demand. A 1600-pound horse of that type is acceptable if he has plenty of quality and finish. Buyers make some discrimination in color. Sorrels with flaxen manes and tails seem to be in great demand. Red roans, blue roans, and dark greys are preferred over bays, browns, and blacks.

Training the horse is important. Eastern buyers like their horses well broken. A horse that is nicely halter-broken but has never been hitched will sell equally as well as a green broken one. The horse that shows

<sup>3</sup> The Horse and Mule Association of America, 407 South Dearborn Street, Chicago, Illinois, in conjunction with the Iowa Horse Breeders' Association, has published a bulletin by Harry D. Lunn, which describes in detail different methods of breaking horses.

harness marks must be thoroughly broken. Southern buyers will pay good prices for young mares from two to four that are only halter-broken if they are right in other respects.

Horses from four to eight years of age will outsell both older and younger ones equal in other respects. This fact makes it possible for



*Chunk type of mare that is always in demand. Height 16 hands (64 inches). Weight 1500 pounds. Distance from floor of chest to ground, 32½ inches. Depth of shoulder, 28 inches. Length of back, 27 inches. Length of hip, 28 inches.*

Nebraska farmers to raise a few colts from their work mares, break them as three-year-olds, and work them on the farm for three or four years. These horses may be sold when they are six- or seven-year-olds and well broken, thus demanding top prices.

Soundness is very important. Good, clean-legged horses that are free of blemishes and unsoundnesses are far more salable than horses that have slight defects, even though these defects do not hinder their ability to work. Some dealers rate "moonblindness" as the worst unsoundness a horse can have. Others say horses having filled hocks and bone spavins are the worst. Other unsoundnesses that hurt the sale price of a horse are curbs, thoroughpins, sidebones, ringbone, and cocked ankles. Farmers in the Corn Belt are not very critical of sidebones if the horse is going back



to the farm for field work only; however, eastern and southern buyers want their horses clean around the hoofhead.

Matched teams always sell better than two others of equal quality that are sold singly. A gelding and a mare are not considered a matched team, regardless of how nearly alike they may be in size, conformation, color, and action.

Other factors that determine the value of a horse are sex, style, action, and quality. Mares have been moving readily for several years and it should be kept in mind that *there is no substitute for quality*.

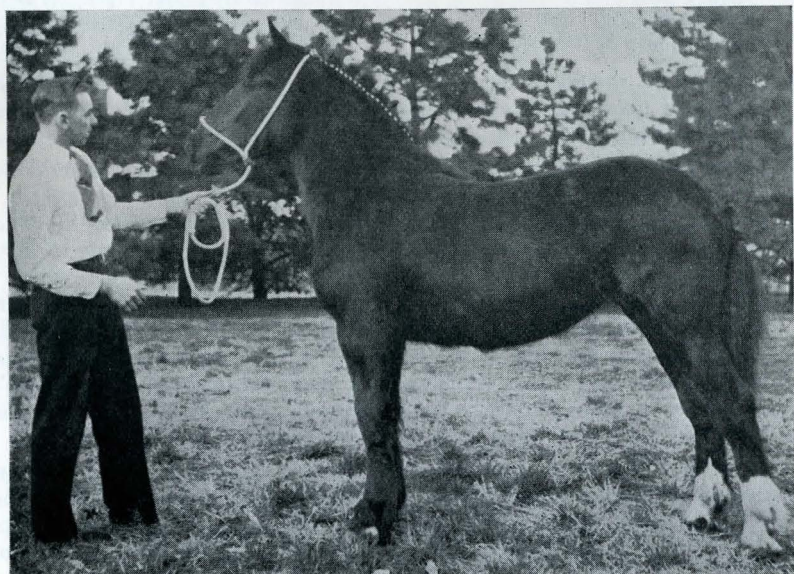
**Fattening for market.**—Two methods are used in fattening horses for market. One is to “stall feed” them and the other is to feed several head of them together in an open lot or corral. The latter method is usually favored by most dealers. The heavier grains may be used to a good advantage in the fattening ration. Corn and barley may be used extensively. Care should be taken not to overfeed the horses at the start and they should have sufficient room in the lots so that they can take plenty of exercise. Ground ear corn and alfalfa meal can be mixed equally by weight and self-fed to the horses at the start of the feeding period. The amount of corncob meal can be gradually increased and finally changed to ground shelled corn as the horse goes on feed, but should never make up more than two-thirds of the ration by weight. Toward the finishing stage a part of the corn should be changed to oats and a part of the alfalfa hay changed to wild hay or timothy, as horses ship better when they have been receiving a less laxative ration. Horses will gain from three to four pounds per day and in some instances more. Thus it is only necessary to feed the average horse about 60 days. One dealer in Nebraska says, “We start our horses on corn and alfalfa and finish them off the last couple of weeks with oats and prairie hay. Our idea is that a horse always ships better off the timothy or prairie hay than off the alfalfa. If the horse is in ordinary flesh, 50 or 60 days on this kind of feed will put him in nice market condition.”

Another dealer in Nebraska practices mixing alfalfa meal and ground corn together at the rate of one-third alfalfa meal to two-thirds corn, by weight. This mixture is placed in bunks and kept in front of the horses all of the time. He also likes to feed molasses with the alfalfa and corn-meal mixture. He says, “Horses fed this way will fatten in about 40 days unless they are exceptionally thin, or are the ‘loose-made’ kind.” This dealer also states that “*Any horse or mule that has good hair and is fat outsells all others.*”

**Fitting for market.**—Do not roach the mane or clip the foretop of the horse. Do no clipping on the legs. Horses that have been subjected to the clippers are not considered to be fresh country horses. Buyers are often afraid that these horses have been used in cities or construction camps and consider them to be “second-hand” horses. Do not shoe them before they are shipped. If you are going to a public market with them do not touch them in any way. Let your commission man get them ready as he should know what the buyers prefer.

**Fitting and training show horses.**—For a great many years the horse show has proved to be one of the best means for promoting the horse-breeding industry, establishing ideals or standards of perfection and for advertising the exhibitor's horses to the public.

Exhibiting at various county, state, and national shows often proves to be an excellent method for a breeder to build a reputation as a producer



*A well-fitted yearling filly, properly braided and well shown. Note how the showman holds the lead and how closely he watches the filly.*

of a certain type and quality of horse. Breeders also are able to sell surplus breeding stock at these fairs and also attract prospective buyers for future sales. The money premiums should be of secondary importance. A breeder should feel well pleased if he is able to win a sufficient amount of money prizes to offset the expenses of exhibiting at a particular fair.

Fitting horses for the show ring consists of the proper training of the horses for a creditable performance and feeding and grooming them into a condition and bloom in which they will make the best appearance. It is better to keep the horses at home rather than exhibit them when they are only half fitted. The horse that is properly conditioned and trained to stand and move correctly may be shown to an advantage over another horse of equal merit that has not been fitted.

**Feeding show horses.**—All show horses should be fattened to a point where they will at least be rounded out into an attractive form. Young, growing horses and colts need not carry as much condition as mature horses.



Oats are the best grain to use in the ration of the show horse and should make up a considerable proportion. Some bran and a small amount of linseed oil meal will prove to be an excellent conditioning feed. The following rations have been found to be very satisfactory:

Oats 4 parts  
Bran 3 parts  
Corn 2 parts  
Linseed oil meal 1 part  
Alfalfa and wild hay, equal parts

Oats 5 parts  
Bran 3 parts  
Alfalfa-molasses meal 1 part  
Oil meal 1 part  
Wild hay

The horses should be fed three times each day. The amount to be fed will depend upon the condition of each individual horse. Horses should be exercised sufficiently each day to keep them fresh and sound in the legs.

**Training.**—Before the horses are taken to the fairs they should be trained to stand with their feet squarely placed and taught to “stretch.” Stretching the average horse a little will help to level up the top line and show the hind legs to the best advantage. He should be taught to hold his head in a stylish, alert position.

He should be trained to move in an alert, aggressive, stylish manner. The lead should be carried in the right hand and the showman should not grip the lead too close to the halter or bridle; thus the horse will soon learn to move out so that the showman may stay even with the horse’s shoulder. The horse should be taught to move straight up and down the arena and at the ends turn away from the leader or clockwise.

**Fitting.**—The show horse must be carefully groomed. All dust must be removed from his hair. The curry comb should be used to loosen the dirt. Free use of the brush on the horse’s coat removes the dust and helps to put a glossy finish on the hair. A woolen rag with a slight amount of sweet oil may be used to wipe off the coat after the horse has been curried and brushed. The mane and tail should be carded out with a mane and tail card, and the mane must be trained to lie to the right. *Do not roach the mane or trim out the foretop.*

The tail should be braided and tied up and a roll may be placed in the manes of the stallions. Recently most showmen are exhibiting the mares without placing a roll in their manes. Imitation flowers may be placed every two or three inches along the mane roll and also in the tail braid.

**Care of the feet.**—It is generally advisable to shoe the show horse a month or two prior to the time he is to be shown. This practice makes it possible to grow a good foot on the show horse. Beveled shoes should be used and the horse should be shod so that he will travel true and straight. The draft horse that is shod is much more capable of moving with snap and style because the shoes cause him to show more knee action and greater flexion of the hocks. It is necessary to change the shoes on foals and yearlings more often than with the older horses in order to insure the proper growth of the young colt’s foot.

Just before the horse is taken into the ring his hoof should be painted with a mixture of oil and lamp black for the dark hoof and just oil on the light-colored hoof.



**Showing.**—Immediately after being brought into the showing, the horse should be set up squarely on his legs. If it is at all possible, stand the horse so that his front feet will be a little higher than his hind feet. Thus when stretched the horse may be shown to the best advantage. The showman should stand facing the horse and on the left side. Any change in position of the legs should be done by use of the lead and by command. Do not use a stick or whip on the feet in getting a horse to change his position. Horses that have been properly trained will change the position of their feet with a very slight pressure of the lead.

When the judge motions for the showman to bring his horse out of the line to show his action, the leader should take the horse up to the judge and follow out the judge's or ringmaster's instructions. Most judges want to see the horse go at the walk and at the trot. The leader should move the horse straight away and straight back to the judge, first at the walk and then at the trot. The horse should then be set up for close inspection and not moved back into line until the judge indicates that he has completed his observations. At all times the showman should be courteous to the judge, the ringman, and also his competitors. He should be a gracious winner and a good loser.

*Popular-sized hitch for Nebraska farms. Note how they are hitched to the 2-bottom gang plow. Only two lines are needed to control this team. Five horses hitched in this manner will plow 5 acres per day.*





### USE OF BIG TEAMS

Multiple hitches or big team hitches have been successfully used in the northwest for a great many years. Some of these hitches have become quite popular in the Corn Belt during the past few years. Big teams are especially well adapted for use in large fields, for any implements used in the preparation of the seedbed and planting, for summer fallowing, pulling combine harvesters, and hauling big loads.

The most popular size of teams used in Nebraska are the five- and six-horse hitches. Occasionally some of the larger operators find it very advantageous to use the eight- or nine-horse team for such operations as plowing, disking, harrowing, or for doing two of these jobs at the same time.

There are different types of equalizers in use and all have their merits. The tying-in and bucking-back method is the most common system used for controlling the team. The buck straps are made on the same principle as lines. They are run through the hame rings and snapped in the bit. From the withers the single strap runs downward and is fastened to some part of the equalized hitch, usually the chain leading to the equalizers of the team in front. In this way when the leaders are stopped their equalizer slackens to the ground, thus pulling back on each of the rear teams. The rear teams cannot start again until the leaders start, thus relieving the pull on the buck strap. By "tying in" is meant the fastening of the halter lead chain to the singletree of the horse in front. This prevents the horse from loafing, just as the buck strap prevents the horse from working too far ahead. The lead or the buck straps may be adjusted according to the way each horse works. For fast horses the leads should be loosened and the buck straps taken up. For slow horses the leads should be taken up and the buck strap let out.

The popular five-horse team, which is commonly used for plowing, hitched with three in the lead and two on the wheel, as shown on page 41, is controlled with two lines on the lead team. The six-horse team, hitched three and three, is controlled in the same way, as are the eight-horse teams, which may be hitched four and four, or three, three, and two, or the nine-horse team, which is hitched three, three, and three. Thus the driver can control any number of horses by using only two lines on the lead team. The advantages of using multiple hitches are:

A saving of man labor is effected.

Horses work more efficiently, because most of the side draft is eliminated. This also results in fewer sore necks and shoulders.

All horses are under complete control.

Horses can be kept cooler because there is less crowding.

The amount of work done per animal is increased.

The load for each horse is equalized.

Two or more farm operations such as plowing and harrowing or disking and harrowing can be completed at the same time.

Bulletins giving complete instructions on how to construct hitches for any size team, as well as other detailed information relative to the use of big teams may be secured by writing to The Horse and Mule Association of America, 407 South Dearborn Street, Chicago, Illinois.



*Four brood mares that not only raise colts but do their share of the farm work.*

### WEIGHTS PER QUART OF FEEDS

Feeders rely upon measurements rather than weights in estimating rations. The following table gives the weights per quart of various feeds:

FEED	WEIGHT OF ONE QUART <i>Pounds</i>	FEED	WEIGHT OF ONE QUART <i>Pounds</i>
Barley, whole	1.5	Rye, whole	1.9
Barley, ground	1.1	Rye, ground	1.7
Corn, shelled	1.7	Sorghum, whole	1.7
Corn, ground	1.5	Sorghum, ground	1.5
Cottonseed meal	1.5	Wheat, whole	1.9
Linseed meal	1.1	Wheat, ground	1.7
Molasses (beet or cane)	2.9	Wheat bran	0.5
Oats, whole	1.0	Wheat shorts	0.8
Oats, ground	0.7		



