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USING HORSES ON THE FARM

by A. L. HARVEY

SUMMARY

1. Horses are one of the most important sources of power on Minnesota farms.

2. The advantages horses have as a source of farm power are that they utilize home-grown feed, they are easily adapted to the work to be done, they are well suited to jobs that require frequent starting and stopping, they can be used successfully on soft, wet ground and rough or hilly land, colts may be raised, and manure produced assists in maintaining soil fertility.

3. The average cost of keeping a horse a year ranges from $50 to $125, with an average of about $85.

4. The cost of horsepower can be lowered by using to capacity a small number of horses and by keeping down the cost of feed and handling.

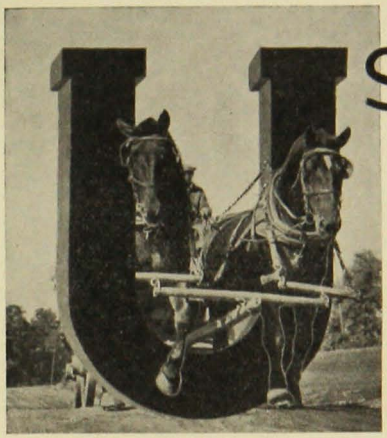
5. The use of the multiple hitch saves man labor and increases the amount of work performed per horse.

6. The cost of raising a colt to working age is about $85.

7. Many farmers should plan to raise colts to meet their work-horse replacement needs.

8. Community ownership is an excellent way of obtaining the services of a good stallion at a low cost to the mare owner.

9. There is much room for improvement in the use, feeding, and care of horses.



USING HORSES *on the* FARM

by A. L. HARVEY

Horses are one of the most important sources of power on farms. Even though there has been a gradual decrease in numbers since 1920, it is estimated[1] that on January 1, 1938, there were 11,163,000 horses and 4,477,000 mules on the farms in the United States, having a total value of $1,562,081,000. Minnesota had 682,000 horses and 13,000 mules, having a total value of $66,752,000. Compared with other states, Minnesota ranks fourth in total number of horses on farms but third in total value.

The principal advantages horses have on the farm are:

1. They utilize home-grown feeds, thereby providing a market for crops and eliminating the necessity of a cash outlay for motor fuel.

2. They can be worked singly or in multiple hitches in accordance with the amount of power needed for the work to be done.

3. They are well suited to jobs that require frequent starting and stopping, such as hauling bundles during threshing and silo filling and hauling hay and feed.

4. They can be worked on soft wet ground as well as on rough or hilly land.

5. They can raise colts which can be used for replacements or sold.

6. The manure produced assists in maintaining soil fertility.

That farmers appreciate these advantages is indicated by the fact that few farms are operated without horses. However, horses must be used as economically and effectively as possible.

The cost of keeping a horse on the farm ranges from $50 to $125 per year, with an average of $85. The cost varies according to the amount and kind of work done, the age, size, condition, and temperament of the horses, and the quality of the feed. A ton and a half of grain, two tons of hay, and an acre of pasture will usually maintain a 1,500-pound farm work horse for a year. By applying local feed prices, a good average estimate of annual feed cost per horse can be obtained. The feed cost represents from 50 to 60 per cent of the total cost of keeping a horse for a year.

Feed cost can be reduced by feed-

[1] Crops and Markets, U.S.D.A., pp. 19-20, February 1938.

ing the horses in accordance with the kind and amount of work performed and by using pasture more. Horses at hard work such as plowing, disking, and harvesting should be fed enough grain and hay, or nearly enough, to maintain their weight. Horses at medium or light work need less than those at hard work, but they should be fed enough to supply their needs. As soon as work lightens, cut down on grain. Even if a horse is idle only a part of a day, his feed should be cut down, not only to save money but to prevent digestive disorders.

The cost of keeping horses can also be reduced by the use of pastures. Horses worked during the day should be turned out on pasture at night whenever weather conditions are favorable. This procedure cuts down the amount of hay and bedding needed. The cost of man labor is reduced because it does away with bedding the stalls and cleaning the barn, besides saving time in feeding. Furthermore, the horses are usually more comfortable than when kept in the barn.

Unless the pasture is very poor, idle horses should be turned out on grass in summer with no extra feed. In winter, they should run in the stalk and stubble fields and be fed, in addition, enough roughage in the form of corn stalks, straw, and hay to maintain their weight.

Access to a straw shed or a shed that is open on the south will afford the horses all the protection needed in bad weather. Horses handled in this way keep in better health than those closely confined in barns.

How to Lower Costs of Horsepower

Horsepower costs can be lowered in two ways: (1) by keeping the smallest number of horses required for work to be done and using them to full capacity; (2) by keeping down the cost of feed and other overhead expenses.[2]

Many farms have more horses than are needed. Extra horses are carried throughout the year in case something should happen to any of those used regularly. When no emergency arises, the extra horses are carried at a loss. If an extra horse is to be kept, it should be one of the lighter types that can be used to ride, drive, and work when needed. It will pay each farmer to study his business to determine the fewest horses he can get along with and then dispose of the extra ones.

In culling out the surplus horses, one should aim to dispose of the old ones and any others that are not good workers and are not easily kept. Keep the young, active, sound horses with the good dispositions.

THE HORSE SUPPLY

Even though horses live 15 to 16 years on the average, a certain number die each year and have to be replaced. The question of providing replacements confronts many farmers. Horses must either be purchased or colts must be raised.

The price of farm horses doubled between 1932 and 1937, mainly because of the marked decrease in colt raising since the World War. The number of mares bred since 1932 has increased each successive year so that

[2] The use of multiple hitches (formerly called big-team hitches) reduces horsepower costs through a saving in time and man labor and increases the efficiency of the horses. The hitches most adaptable to Minnesota conditions are five-, six-, and eight-horse combinations. Detailed application of these hitches can be obtained from the Horse and Mule Association of America, 407 South Dearborn Street, Chicago, Ill.

at the present time (1938) just about enough colts are being produced to provide replacements for our present horse population.

It costs just about as much to raise a colt to working age as it does to keep a work horse for a year. Under present conditions, it costs $80 to $90. At that rate it will continue to be good practice for the average Minnesota farmer to raise enough colts to provide his own replacements. Furthermore, if good 1,400- to 1,600-pound farm chunks continue to bring from $125 to $160 per head on the market, it will be a good policy to raise an additional colt or two to sell.

Breed Young Mares to a Good Stallion

To raise good work horses, the best and youngest mares should be mated to a good stallion. There are approximately 1,500 stallions licensed for public service in Minnesota. Almost all of these are purebreds. The fact that a stallion is licensed indicates that, at the time the license was issued, he was sound in accordance with the law; i.e., free from "bone spavin, sidebone, ringbone, curb (when accompanied by curby formation of the hock), glanders-farcy, maladie-du-coit, urethral gleet, and mange," but it does not tell anything about the type of the stallion nor his ability as a sire.

All the available stallions in the community should be carefully investigated both as to type and as a sire of colts before deciding which one should be used. Select one to produce colts that will be short-backed, wide and deep-middled, straight and clean-legged, and have large, tough feet, good action, and an energetic yet manageable disposition. Horses of that type weighing from 1,400 to 1,600 pounds will top the market. Remember that breeding mares to a stallion that commands $5 to $10 above the average service fee charged may mean $50 to $100 added to the selling value of the colts when matured.

How to Secure the Services of a Good Stallion

If the services of a good stallion are not available, the mare owner may purchase a stallion himself, purchase one in partnership with one or more other mare owners, or purchase a share in a stallion with members of his community.

Private ownership allows the mare owner the opportunity to select a sire he likes. He can use the stallion on his own mares and limit the use for public service as he sees fit. By paying cash and buying privately he can usually make the purchase at a reasonable price.

During the last few years many farmers who have had an eye toward the future have been purchasing stallion foals and yearlings. One of the principal advantages in purchasing a foal is the low cost. In most cases the price ranges from $100 to $250, with an average around $150. If the colt is a growthy one, the purchaser will put him at light work in the spring when he is two years old. The work the colt does will be just the exercise he needs for proper development. The training he gets will be an asset when he is old enough to breed mares. The colt can be used to breed the owner's mares during the year. In this way the colt will just about pay for himself and for his feed and care by the time he is three years old.

Many farmers do not care to invest from $300 to $1,000 in a stallion and

FIG. 1. A STALLION OF EXCELLENT TYPE

Loewenstein, 16928, three times grand champion Belgian stallion at Minnesota State Fair; grand champion at International Livestock Exposition, 1937, formerly owned by University of Minnesota, now owned by Michigan State College.

assume all the risks, with the possibility of not getting enough outside mares to breed to make the investment profitable.

Partner ownership has most of the advantages of private ownership and the partners have a share in the profits and risks involved.

Community ownership, by either the "mare" plan or so-called "colt club" plan, enables a community to have a good stallion without any one person having to invest a large sum of money. More money is available for the purchase of a sire, and usually a better one is secured. If a man has an interest in a horse, greater care is taken to get the mares in foal and to raise the colts. This method of ownership also insures uniform colts in the community, making it easier to match teams and also easier for a buyer to choose a uniform carload of horses if a surplus is raised.

The disadvantage of community ownership is that in most cases stallions cost more when purchased this way because few communities will get together on their own accord. Usually a salesman for a breeder or dealer has to organize the mare owners before he can sell them a horse. This sales expense, as well as credit, often extended, necessarily increases the cost of the stallion to the group.

The community plan is a satisfactory means of purchasing a stallion, but it would be more economical if mare owners would organize their own club,[3] decide on the kind of horse needed, advance enough money on the mares to be bred to cover the cost of the stallion, and select a man or a committee to make the purchase from a reliable breeder or dealer. In this way services of a good stallion can be secured at a minimum cost.

THE STALLION

Feeding the Stallion

During the breeding season the stallion should be fed as is a hard-worked horse, which means that if he weighs 2,000 pounds, he will require from 20 to 25 pounds of grain daily and about the same amount of hay. A grain mixture consisting of 60 per cent oats and 25 per cent crushed wheat, about 15 per cent of wheat bran, with an occasional handful of linseed meal is an excellent one. Not much corn should be fed, especially during the breeding season, as it is too fattening. A mixture of timothy and clover hay is excellent as roughage, altho prairie and alfalfa hay can be substituted to good advantage. The hay must be of good quality and not dusty or moldy. After the breeding season is over, the amount of grain should be reduced and the proportion of roughage increased. Water and salt must be supplied regularly.

Care of the Stallion

It is absolutely necessary for a stallion to get plenty of exercise if he is to maintain his vitality and breeding ability. In going from farm to farm, during the breeding season, from five to twenty miles are covered daily, which is sufficient. If the stallion is not travelled during the breeding season, exercise can be secured by having an exercising yard connected directly with an outside door to his box stall so that he may have the free run of both the box stall and the yard. This yard may be fenced with a high board or a strong woven-wire fence. Many owners who stand their stallions at home, work them every day. This is a very good practice. Besides getting enough exercise, the stallion is paying for his keep as a work horse.

It is important to keep the stallion's feet trimmed. If the owner cannot trim the horse's feet himself, he should have the blacksmith or horse-shoer do it.

Some stallion owners make the mistake of using their stallions too much. A two-year-old should not be allowed to serve more than 8 or 10 mares per season; a three-year-old may breed from 25 to 30; a four-year-old from 40 to 50, and a mature horse from 75 to 100. The number of mares served should be limited to one in five days for the two-year-old and two a day for a mature horse.

[3] W. E. Morris, of the University of Minnesota, has formulated a plan for community ownership of a stallion. A copy may be had by writing him in care of the Extension Division, University Farm, St. Paul.

WORK HORSES

Feeding Work Horses

No one feed or combination of feeds will meet conditions in all parts of the state. Usually, the crops grown locally will provide the most economical rations. The kinds of feed used, the quantity per horse, and the manner of feeding depend upon the age, size, and condition of the horse and the kind and amount of work.

In general, the average horse doing ordinary farm work requires about one pound of good sound grain and one pound of good, bright, clean hay per 100 pounds of live weight per day. When at hard work, the grain ration may need to be increased 0.1 to 0.2 pound per 100 pounds of live weight. The grains commonly fed to horses in Minnesota are oats and corn. Oats are 70 per cent digestible and fairly high in protein. The kernel is incased in a hull which gives the grain bulk and prevents digestive trouble through gorging, tho it furnishes little nutriment. Corn is high in energy value but is low in protein and mineral matter. It must therefore be supplemented with feeds that are high in protein and minerals.

The legume hays—sweet, alsike, or red clovers and alfalfa—fed as the sole roughage or as part of the roughage ration help balance the deficiencies in the corn. If a legume hay is not available, linseed or cottonseed meal or dry-rendered tankage can be used. The most satisfactory way to feed corn is to grind the ears and feed it as corn-and-cob meal. There is some feeding value in the cobs, and they add bulk to the ration. Corn-and-cob meal is just as satisfactory as oats for work horses and can be fed more economically than oats until ear corn costs twice as much per bushel as oats.

Barley, wheat, and rye are sometimes fed, but they have a tendency to become pasty and "ball up" when chewed. This may lead to impaction in the stomach or bowels. The beards of the grain may also cause trouble. If barley, wheat, or rye is used, it should be fed in combination with other feeds. Wheat bran and linseed meal are excellent supplements for rations that are low in protein. Wheat bran is bulky and laxative in effect. Linseed meal is laxative and also softens the skin and gives the hair a silky appearance. Not more than 20 per cent of the ration should consist of wheat bran, and 1½ pounds of linseed meal per head daily is sufficient. Cottonseed meal is a high-protein supplement that is less laxative than linseed meal. It is commonly fed at a rate of about one and a half pounds per head daily.

Recent experiments indicate that horses will eat rations supplemented with dry-rendered tankage. In addition to being high in protein, tankage is rather high in mineral content. From three fourths to one pound of tankage is equal to one and one-half pounds of linseed oilmeal in rations for horses.

Prairie hay, straight timothy, timothy and clover, or timothy and alfalfa mixed are the most common roughages fed to work horses. A ration composed entirely of alfalfa or clover hay is not recommended, because these feeds are softening to the muscles and are too laxative. However, alfalfa or clover can be fed to good advantage along with other roughages, if it does not exceed half the hay ration. Following are a few sample rations for a 1,500-pound horse at hard work:

1. Oats, 17 pounds; timothy or prairie hay, 15 pounds.

2. Corn-and-cob meal, 16 pounds; alfalfa or clover hay, 8 pounds; timothy or prairie hay, 7 pounds.

3. Shelled corn, 13 pounds; bran, 2 pounds; linseed oilmeal, 1 pound; timothy or prairie hay, 15 pounds.

water. When they have had a chance to cool off, let them drink all they want. Salt should be accessible at all times.

Because of the peculiar digestive system of the horse, he is subject to founder, colic, and azoturia. These ailments are brought about largely be-

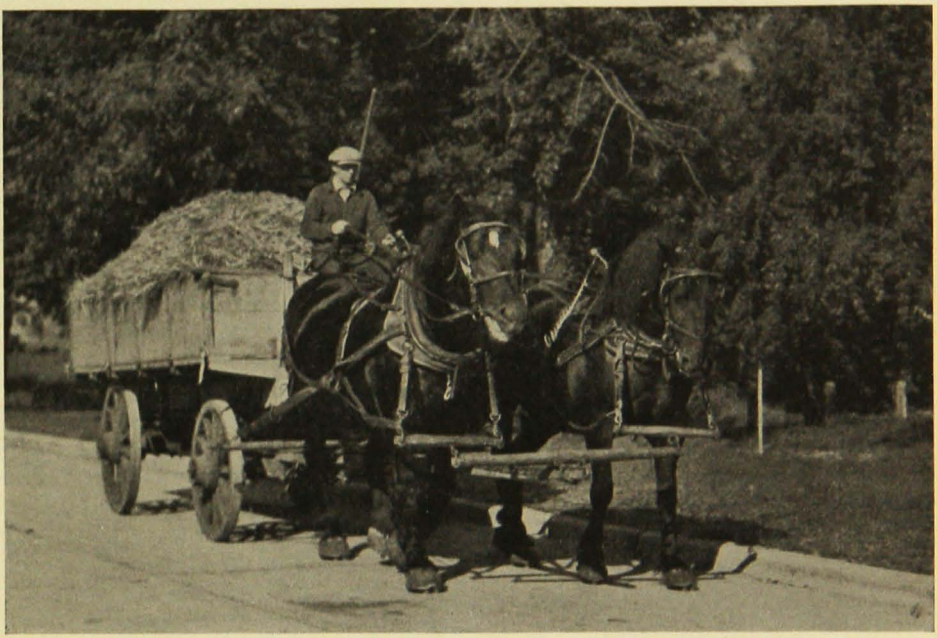


FIG. 2. PRIZEWINNERS AT WORK

Hezekiah, 209766, grand champion Percheron stallion, and Peggy, 203104, first-prize Percheron mare at Minnesota State Fair, 1938.

The feed needs no preparation unless the horses are old or their teeth are bad, in which case it is best to grind it. The grain should be fed in three equal feeds per day. The largest share of the hay should be given at night. Horses should be watered regularly at least three times a day in the winter and at least five times a day during warm weather. If they are very warm when they come in from work, allow them to drink only a little

cause of lack of judgment on the part of the feeder. When horses are at hard work, they must be given large quantities of feed. As soon as the work lightens or the horses stand idle a part of the day, the grain ration should be cut down at least a third, preferably a half. It is a good practice to substitute a bran mash, made by mixing about five pounds of wheat bran with warm water and adding a tablespoonful of salt, for the regular evening feed

of grain on Saturday nights. On Sunday feed very little grain, if any.

The Use of Pasture.—The extensive use of pasture for work horses cannot be overemphasized. Horses that work every day should be turned out at night while the weather is favorable. Not only does this keep the digestive system toned up, but it decreases the amount of hay needed and eliminates the necessity of bedding and cleaning the stall each day. Horses turned on grass at night may sweat a little more than those given only dry feed, but the benefits derived by being out in a clean, cool place where they can roll, graze, and obtain water at will more than overbalances this slight disadvantage.

Permanent pastures of blue grass and brome grass are good for spring and fall grazing. Sudan grass is an excellent summer pasture. Horses like it, and its carrying capacity is greater than that of the other grasses. Pasturing this crop during severe drouth or after a killing frost must be done with care as there may be danger of cyanide poisoning. However, horses are not so susceptible as cattle and sheep. Alfalfa and red clover are also very good. Sweet clover can be pastured to good advantage in certain sections, but horses pastured on sweet clover should have some dry roughage available. Alsike and white clover are excellent in a mixture with red top and blue grass.

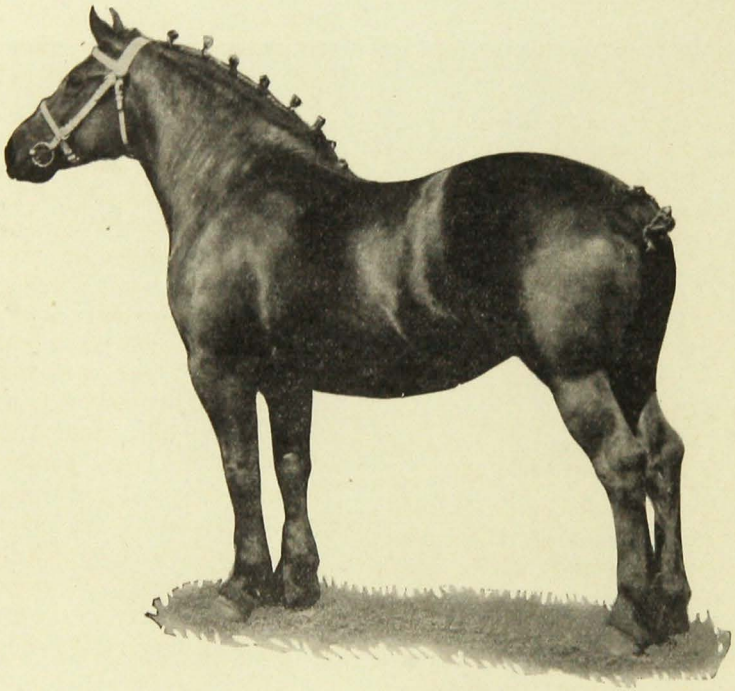


FIG. 3. THREE-YEAR-OLD PERCHERON MARE, AN IDEAL FARM MARE
She has size, a good middle, good quality, and an energetic disposition.

Care of Work Horses

The farmer who gets the most work from his horses is the one who takes the best care of them at all times. He does everything he can to keep his horses comfortable when at work and when idle. Careful attention at all times will increase the efficiency of horses and reduce costs.

Each horse should have a stall large enough so that he can lie down in comfort. It should be well-bedded and clean so that the horse will want to lie down and rest. Clean stables mean fewer flies and little or no trouble from thrush and scratches.

Flies, mosquitoes, and other insects pester horses a great deal and reduce their efficiency. Stables can be darkened by hanging gunny sacks over the windows. Sacks can also be hung across the tops of the stalls so that the horses by moving about can brush the flies off their backs. Fly nets should be used on the work horses. In addition, liberal use of a good fly spray[4] and frequent spraying of the stable with a disinfectant will be helpful.

Working Horses During Hot Weather.—Horses at work in hot weather must be watched closely so they will not become overheated. Once they have been affected by the heat they never recover fully. To avoid overheating, work them early in the morning, late in the afternoon, and in the evening. Allow them to rest often. Give them an extra pailful or two of water in the middle of the morning and afternoon.

Symptoms of overheating are a slowing up of the natural gait, a tendency to wobble in walking, rapid breathing, excessive dilation and redness of nostrils, watery and bloodshot eyes, and high temperature, accompanied by little or no sweating. If such symptoms are noticed, the horse should be taken to a shady place, its body sponged, and its legs showered with cold water. Its mouth and nostrils should be washed out and ice packs applied to the head. It is always wise in such cases to call a veterinarian.

Grooming.—Work horses should be groomed daily. Most of the grooming should be done with a dandy or fiber brush. A currycomb may be used sparingly to loosen up the dirt and manure. The horse's legs should receive special attention, for if dirt, mud, or manure is allowed to gather, there is danger of the horse developing scratches. This condition usually occurs on the hind cannon bones and fetlocks and is very bothersome. It causes the horse to rub one leg with the other and stamp his feet constantly.

Scratches can be treated by clipping all the long hair off the affected parts, washing thoroughly with a disinfectant, and rubbing flowers of sulphur on the legs twice a day.

As a rule horses are not washed, as water seems to retard skin secretions and leaves the coat dry and harsh. Occasionally, it may be necessary to wash the horse's legs. If this is done, care should be taken to rub them dry with clean cloths or dry sawdust.

Care of the Feet.—The feet of the horse should receive regular care. Each foot should be picked up and the bottom cleaned every week or two

[4] The Bureau of Animal Industry, U.S.D.A., recommends a home-made insect spray. They say: "An effective and rather inexpensive spray material may be prepared by extracting pyrethrum flowers (wholesale at 40 cents a pound in 5 pound containers) in kerosene for 48 hours, using one pound of flowers to a gallon of kerosene. Two parts of this extract are then thoroughly mixed with one part of water containing 3 to 5 per cent of soft soap. The mixture is now ready for use." It can be applied with an ordinary spray gun.

to prevent foot rot, commonly called thrush. Foot rot has a characteristic foul odor. It usually develops when horses are allowed to stand in dirty stables. It can be cured by cleaning the hoofs thoroughly and applying a strong disinfectant. The stall should also be cleaned and disinfected.

On the average, feet of farm horses need to be trimmed every four to six weeks. They should be trimmed so that the feet and legs set squarely under the horse. Each foot should be picked up and the excess growth of the sole and frog removed with a hoof knife. Hoof pincers should be used to trim the outer rim of the hoof wall down about even with the sole. Rasp the rough edges off so the foot will set level. If the horse will not let a man pick up his feet, stand him on a plank floor and trim the hoofs with a long-handled chisel and a hammer. This method does not take care of the bottoms of the feet, but it will prevent the feet from getting out of shape and also will prevent quarter cracks.

Shoeing.—Usually it is not necessary to shoe horses. Only horses whose feet are soft and wear off quickly or those that are worked on the road or hard ground will need to be shod. In the winter, it may be necessary to have one team shod with sharp calks. If so, iron shoes that can be fitted with replaceable calks should be used. Some farmers can shoe their own horses, but ordinarily they should be shod by a professional horseshoer.

SLEEPING SICKNESS
(Equine Encephalomyelitis)

The practice of turning horses out on pasture at night and when they are idle has one drawback, the danger of contracting sleeping sickness. The epidemic of 1937 caused the death of a large number of horses in the United States as a whole, and in Minnesota.

A majority of the horses that contracted the disease were out on pasture during the day or night, while those that were kept in stables and protected as well as possible from flies, insects, and especially mosquitoes, were not affected nearly so much.

Because of the newness of the disease, not a great deal is known about it. However, it is known that the disease is caused by a filter-passing virus, and it is thought that this virus is frequently carried from one horse to another by mosquitoes, for the virus has been found in certain species. If mosquitoes are the carriers, then in case of an outbreak horses should be kept in stables, preferably stables that are screened or are regularly sprayed with a good fly and insect spray. See page 11.

SYMPTOMS: Sleeping sickness must be recognized in its early stages if it is to be treated with any success. The symptoms vary. Usually the first sign noticed is that the horse refuses his feed. Close observation shows a general dullness and drowsiness. Later the horse will have a "wobbly" gait and in many cases will travel in a circle if left alone or may act as if he wanted to sit down. If his temperature is taken, it will probably be from three to six degrees above normal (100° F. is normal for a horse).

TREATMENT: Call a competent veterinarian at once. In the meantime, get the horse into a cool, dark, large, well-bedded box stall where he will be away from flies and mosquitoes. Give the horse all the cool fresh water he will drink. Hold the pail so he can

drink it. When the veterinarian arrives, follow his instructions.

VACCINATION: The use of vaccine in the treatment of sleeping sickness is still in the experimental stage. Reports concerning its value are conflicting. A new vaccine made from chick embryo is reported to have protective value. After talking with the veterinarian, the horse owner will have to decide for himself whether he should vaccinate or not.

BROOD MARES

Young mares that are to be developed and used as brood mares should be bred when they are three years old to produce their first foals when about four years old. Getting mares in foal presents more of a problem than the breeding of other livestock. Usually not more than 60 to 75 per cent of the mares bred will prove to be in foal even tho they are retried several times following the first service. The farmer should breed enough mares so he will be sure to have as many colts as are desired. On small farms, mares that are not in foal may do the hard work, so no loss will be experienced because of their not raising colts.

The one economical and satisfactory way of handling brood mares is to keep them at work throughout the year. Mares that are bred in the spring but are not suckling foals may be worked and fed throughout the summer and fall the same as work horses. Mares that are raising foals and are bred again should be given the lightest work and should be handled and driven carefully and quietly. It is best to have as many mares as possible foal in March. Brood mares should be counted on as regular work horses. Therefore, it would be a serious handicap to the spring work if they all foaled in the middle of the busy spring seeding season and had to be rested for a few days. On this account, it is desirable to try to adjust the breeding dates so that the mares will foal either before the spring work begins or not until after it is practically complete—late in May or in June.

Feeding the Pregnant Mare

The ration usually fed to a work horse is a good one for the mare in foal. A pregnant mare doing moderate work and nursing a foal at the same time is comparable to a hard-worked horse and must be fed accordingly. Feeds that are rich in protein and mineral matter, as oats, bran, clover, and alfalfa, should be used as a basis for the ration. A very good ration consists of 75 per cent oats, 20 per cent wheat bran, and 5 per cent linseed meal, with bright clover or alfalfa hay as half the roughage and prairie or timothy hay, oat straw, or corn stover as the rest. Mares in foal should have access to iodized salt and fresh water.

Care must be used in feeding to guard against the mare's becoming too fat, so she will not have difficulty in foaling. A few days before foaling and for a short time after, the mare's ration should be reduced considerably and made laxative by the addition of more bran or by occasionally giving only a bran mash instead of the regular grain ration.

Care at Foaling Time

The period of gestation in the mare ranges from 315 to 350 days. The average is about 335 days, or 11 months. The mare should be worked

right up to the time of foaling. By so doing she will get the exercise she needs. She should not be compelled to do heavy work where there is danger of straining.

Certain signs indicate the approach of foaling. Usually the udder will start to develop from four to eight weeks previous to foaling. About a week or ten days before foaling, there is a marked falling away of the muscular parts at the top of the buttocks near the tailhead. The udder becomes distended, but the teats seldom become full and plump until two or three days before the foal is born. Wax often appears at the ends of the teats at this time. Occasionally a foal may be born without any of these signs.

For mares that are bred for May or June colts, the best place to foal is in the pasture. Mares that foal earlier must have a roomy, well-lighted, and well-ventilated box stall, thoroly cleaned and freshly bedded. During the night it may be necessary for someone to be near at hand to assist if needed. If the mare does not foal alone within a reasonable length of time, she should be helped. A mare foals rapidly; if assistance is needed, it must be given promptly. If the foal is not presented normally (forefeet and then the nose), a veterinarian should be called.

As soon as the colt is born, the attendant should clear its mouth and nostrils of mucous, and it may be necessary to rub the ribs vigorously to stimulate breathing. If the navel cord does not break, it should be severed by scraping it apart about two inches from the colt's body. Regardless of how the navel is severed, it should be disinfected by dipping it in diluted tincture of iodine, mercurochrome, or by dusting it with some disinfecting powder such as boric acid or iodiform powder. As soon as the mare gets up, give her a drink of water from which the chill has been removed. The afterbirth should be tied in a knot so that the foal or mare will not step on it. If it should not come away completely within six or eight hours, a veterinarian should be called. Retained afterbirth may cause founder in the mare. The afterbirth should be burned or buried.

Mares that have had no trouble in foaling will be able to do light work within a week, if necessary; others may have to rest longer. In either case, the mare and foal should be given light exercise each day, beginning two or three days after foaling. Exercise is necessary for the health of both, and it assists greatly in strengthening the colt's legs.

The feed of the mare should be held down until the colt is able to take all the milk, after which she can be fed in accordance with the amount of milk she produces and the amount of work done.

SUCKLING FOALS

It is sometimes necessary to help the newborn foal to nurse by assisting him to stand up and by placing the teat in his mouth. It is essential that he get the first milk from the mare, as it is a natural purgative or physic, which assists in removing the material that has accumulated in the digestive tract of the foal during the last few days of its development. The colt's bowels will usually move within six hours after birth. If they do not, the colt should be given a couple of ounces of castor oil. Some breeders prevent the possibility of the colt's becoming con-

stipated by giving a rectal injection of warm soapy water shortly after birth.

When the mare goes back to work, the colt should be left in the barn away from the heat and flies. It is a good plan to allow him the run of a large box stall that opens into a lot. If there are two or more colts, they can run together. In this way they will be company for each other and still get plenty of exercise. If the mare must go to work a week or ten days after foaling, she should be brought in at the middle of the forenoon and afternoon to allow the colt to nurse. This practice may be discontinued when the colt is three or four weeks old, but the mare's udder should be milked out a couple of times during the day and also a little just before the colt is allowed to nurse at noon and at night. This is especially important if the mare has been worked hard and during warm weather.

At about four weeks of age, the colt will begin nosing into his mother's feed box and hay manger. As soon as he learns to eat a little, he should have a grain box and hay manger of his own where he can be fed a little oats and bran and some good hay, preferably clover or alfalfa.

Colts are usually weaned when they are five or six months old. Weaning is not a difficult task if the colt has been fed all the grain and hay he would eat while nursing. The best method of weaning is to take the colt away from the dam and keep him away. The mare's ration should be cut down at least half until she dries up and her udder should be milked out occasionally to prevent caking. The mare should be kept at work, as exercise assists in the drying-up process.

Raising an Orphan Foal

Sometimes it becomes necessary to raise a foal that has lost its mother or whose mother has not sufficient milk. Mare's milk is higher in percentage of water and sugar than cow's milk and lower in other components, so in raising an orphan on a bottle care must be taken to provide milk of about the same composition. Milk from a fresh cow, low in butterfat, should be used. To about a pint of milk, add a tablespoonful of sugar and from three to five tablespoonfuls of lime water. Warm to body temperature and for the first few days feed about one-fourth pint every hour. As the foal grows, increase the amount and reduce the number of feedings per day. After three or four weeks the sugar can be stopped, and at five or six weeks skimmilk can be used entirely.

Cod-liver Oil for Foals

Occasionally foals are born with crooked legs and ankles. Some are so bad that they are unable to stand and must be held up to nurse. They can often be helped by feeding a tablespoonful of cod-liver oil twice a day. Colts that are born in the winter or spring months and do not have much opportunity to get out in the sunshine will benefit from a daily dose of cod-liver oil. It should be included as part of the orphan foal's ration.

GROWING THE COLTS

On most farms the foals do well up to the time they are weaned, but from then on life is rather difficult. At weaning time they are turned out on pasture, which at that time is usually poor, and from then on until they are old

enough to be put to work they must rough it. This is poor practice, particularly from weaning time until they are a year old, because a horse should make half his mature weight during his first year, and colts that are not well fed during this time never fully attain their normal growth. It is therefore important that a weanling be well fed and cared for during his first fall and winter. Even if the fall pasture is good, it is a good plan to give the colt some additional feed.

Feeds that promote growth should be supplied. Good, clean clover hay, free from dust, is palatable and slightly laxative. Well-cured alfalfa hay is one of the best roughages for growing colts, but because of its relatively high protein content it is usually economical to supplement it with other roughage, such as timothy, mixed hay, or corn fodder. Besides lending variety to the ration, such a method of feeding alfalfa would offset any likelihood of kidney or bowel irregularities.

Prairie and timothy hay of high quality are good roughages for colts. Sheaf oats may be used to advantage to supplement other roughage. The colts should be given only as much as they will clean up readily, but at the same time enough feed should be supplied. Oats, corn, and peas are suitable grains and should be ground if possible. Bran, linseed meal, cottonseed meal, or dry-rendered tankage will add protein and lend variety. Appropriate grain rations for the first winter are:

1. 70 per cent oats, 15 per cent corn, and 15 per cent bran.
2. 50 per cent oats, 20 per cent corn, 20 per cent bran, and 10 per cent linseed meal.

The weaned colt should be fed about three-fourths pound of grain and one and one-half pounds of good roughage per 100 pounds live weight per day during his first winter, in addition to any fall and winter pasture that might be available. Iodized salt and pure water should be accessible at all times. Exercise is just as essential as feed if a colt is to develop properly. He should be turned out in a pasture or lot with other colts or horses for exercise every day.

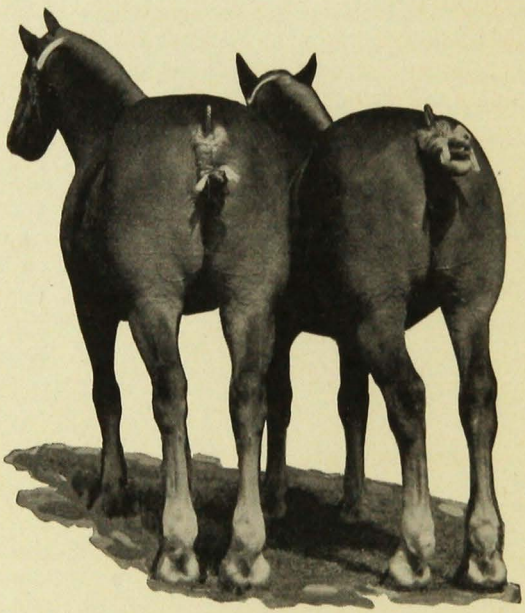


FIG. 4. YEARLING BELGIAN FILLIES, SIRED BY LOWENSTEIN, 16928, BRED AND OWNED BY UNIVERSITY OF MINNESOTA

Note the heavy muscled hindquarters and correct set of legs.

Colts may be housed satisfactorily in either the stable or an open shed. The main requirements are that the quarters be dry and clean and provide fairly good protection from winds. They should be kept well bedded and occasionally should be disinfected.

Several foals may run together if the weaker ones are not driven away from their feed by the stronger ones. Lice are to be suspected when the animals rub and lose patches of hair. It costs money to feed lice, consequently efforts should be made to keep the colts free from them. Thorough washing with the proper solutions of coal-tar disinfectants will kill lice. If the weather is cold, rub a mixture of equal parts of flowers of sulphur and ground sabadilla seed into the hair coats. This procedure should be repeated twice at two-week intervals. During the first winter, the foal should be taught to lead and to stand tied.

Feeding and Care of Yearling and Two-Year-Old Colts

If colts have been well fed and cared for until they are ready to be turned out on pasture when they are a year old, they will get along nicely from then on with little care. As soon as the grass is old enough so that it will not be too washy, the colts should be turned out to pasture. The change from dry feed to grass should be made gradually. In some years the pasture becomes bare about the first of August. Then it may be necessary to supplement it with hay and one feed of grain a day to supply the needs of growing colts.

During the second winter and to the time they are ready to go to work, at two and one-half or three years, colts can be fed and handled in much the same way. The quantity of feed will have to be increased in proportion to the size of the colt, but the quality need not be so good as that fed the first year. Coarse, rough feeds, such as cornstalks, sweet clover hay, and oat straw, properly balanced with a little grain, can be used to good advantage. It is not economical or practical to feed a growing colt all the grain he will eat unless he is underweight. Colts that receive a liberal roughage ration of good quality and a limited grain ration, one-half to two-thirds full feed, will develop into as good work horses as those fed all the grain they will eat.

From weaning time on, the feet of the colt must be watched closely and trimmed whenever necessary. Some colts' feet grow faster than others, but as a rule a trimming every two months will keep them in good shape. Feet should be trimmed so that they will be level. Usually trim only the outer rim. Sometimes it is necessary to cut down the heel or frog or shorten the toes. If the sole of the foot becomes infected, it should be trimmed out and thoroughly disinfected.

The best time to castrate a stallion colt is in the spring when he is a year old, just after he has been turned out on pasture. At this time the chances of infection are small.

FEEDING IDLE WORK HORSES IN WINTER

Horses that are idle in summer can simply be turned out to pasture. In winter, shelter and feed must be provided. Many farmers keep all their horses in the barn during the winter. This method is not economical, nor is it necessary. After the fall work is done, one should decide which of the

horses are to be used for work around the farm during the winter and which are to be turned out to rough it. If any mares are in foal, they should be used. In that way they will receive enough exercise, they can be given a little extra feed if necessary, and they will also be under close observation. The horses that are not to be used can be turned out with the growing colts to pick up what they can from cornstalk fields and grain-stubble fields. Other roughage, such as corn fodder, wild hay, and oat straw, can be fed as needed in racks in the barnyard.

In addition, a small quantity of good legume hay or grain rich in protein should be given daily to help balance the ration and keep the animals in good health. The amount to be given will depend upon the condition of the horses in a barn where they would have to be cared for individually.

PREPARING FOR SPRING WORK

About the first of March, preparations for spring work should be started. The work horses should gradually be changed from a ration consisting largely of coarse roughage to one that contains a large proportion of grain and better hay. They should do a little work each day in order that the muscles may become hardened gradually. The amount of feed and work should be increased fast enough so that the horses will be able to go into the fields and do a good day's work when spring work begins.

Special attention must be given to the shoulders at this time so that they

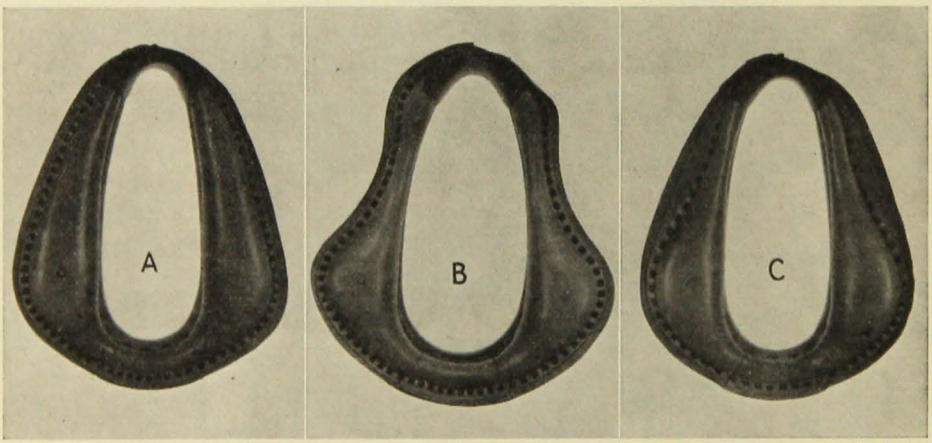


FIG. 5. A, STRAIGHT-FACED COLLAR; B, FULL-SWEENEY; C, HALF-SWEENEY

when turned out and how much gain is to be put on during the winter. If a straw shed or a frame shed opening on the south is available for the horses to run into for protection during stormy weather, it is better to handle them all in this way than to try to shelter them

will not gall. After the harness is removed, wash the shoulders with warm water and soap. Then rinse with cold water to which a handful of salt has been added. This treatment toughens the skin. It may be necessary to continue this treatment throughout the

spring and summer. Small galls can be treated effectively by painting them with tincture of iodine.

Fitting Collars and Hames

There are several different kinds and shapes of collars on the market. The most common shapes are the regular or straight-faced, the half-sweeney, and the full-sweeney. (See A, B, and C in Fig. 5.) The regular or straight-faced collar should be used on horses with long flat necks. A half-sweeney should be used on horses whose necks are a little thick. A full-sweeney collar should be used on horses whose necks are very thick and whose shoulders are steep.

Each horse should have his own collar, which should be fitted properly. The size of the collar is determined by measuring the distance in inches from the top to the bottom of the inside of the collar. In addition to fitting the shape of the neck, the collar must be wide enough to allow a man's fingers to pass up and down along the side of the neck between the collar and the neck. It should be long enough so that a man can put three fingers between the collar and the throat when the collar is pressed back against the shoulders.

If the collar is a little large but fits the neck in every other respect, a pad may be used. The best kind of a pad to use is one faced with oilcloth. It is cooler and easier to clean.

There are several kinds of collars on the market, such as the adjustable, the flexible, the sponge rubber, and pneumatic, but the most common is the all-leather collar. Canvas collars are cheaper but do not last so long as the leather collars.

A collar should be put on and removed by turning it upside down and slipping it over the horse's head. Continuous buckling and unbuckling breaks the bottom and makes it hard to keep the hames on tight. The face of the collar should be kept clean by washing with warm soap and water and drying immediately. Scraping roughens the collar, which in turn may cause sores to develop on the horses' shoulders.

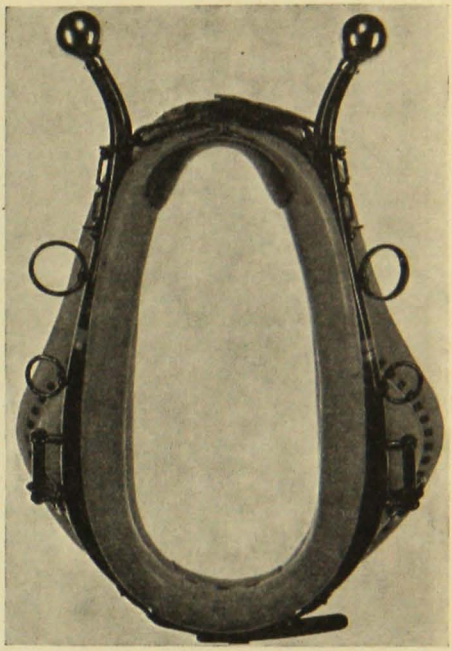


FIG. 6. PROPERLY FITTED HAMES

It is just as important to have the hames fit the collar properly as it is to have the collar fit the horse's neck. The size of the hames should correspond to the size of the collar, i.e. 21-22 inch hames are needed for a 21-22 inch collar, 23-24 inch hames for a 23-24 inch collar, and so on.

The hames should fit the rim of the collar closely all the way around. They should be long enough so that the traces will be about one-third the way up on the shoulder. The top hame strap should be adjusted so that it will

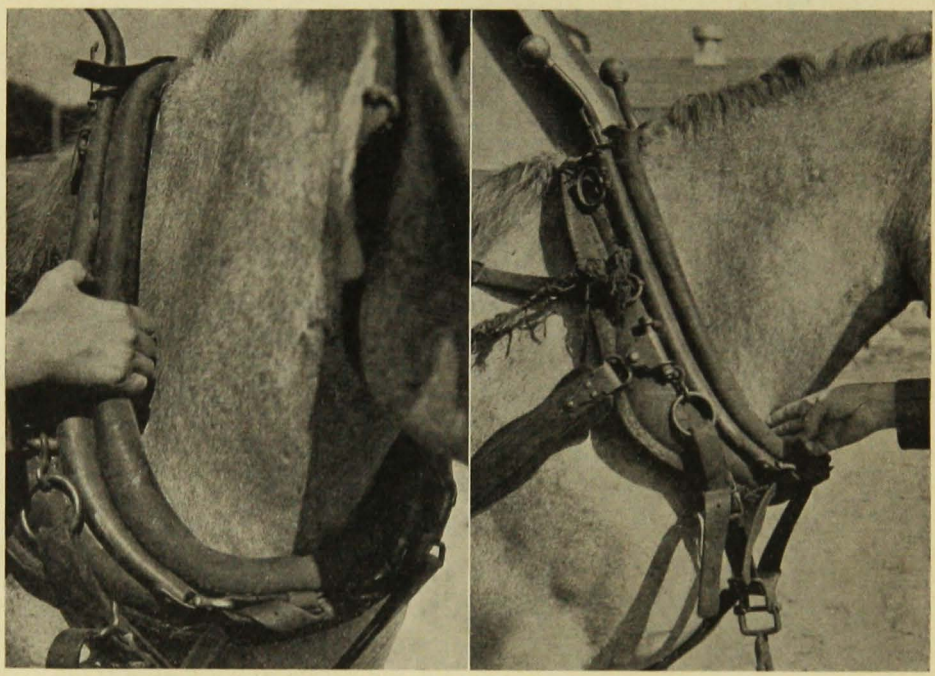


FIG. 7. A PROPERLY FITTED COLLAR

lie straight across the top of the collar. If the top hame strap is in the shape of an inverted U, the pull of the tugs will spread the hames at the top and cause sore shoulders.

Sore necks and shoulders should be washed with warm water and a little soap and the sore spots covered with zinc-oxide ointment or dusted with an antiseptic powder such as boric acid and alum. Small bunches on the shoulders should be painted with tincture of iodine.

Care of Harness

At least once a year the harness should be taken apart and cleaned, repaired, and oiled. After the harness has been soaked about 15 minutes in lukewarm soapy water, each strap should be scrubbed carefully and rinsed. Add blacking where needed, and while still wet oil with neat's-foot oil or a good commercial harness oil. If the harness is very dry, a second oiling may be necessary.

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