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HORSE CARE AND MANAGEMENT

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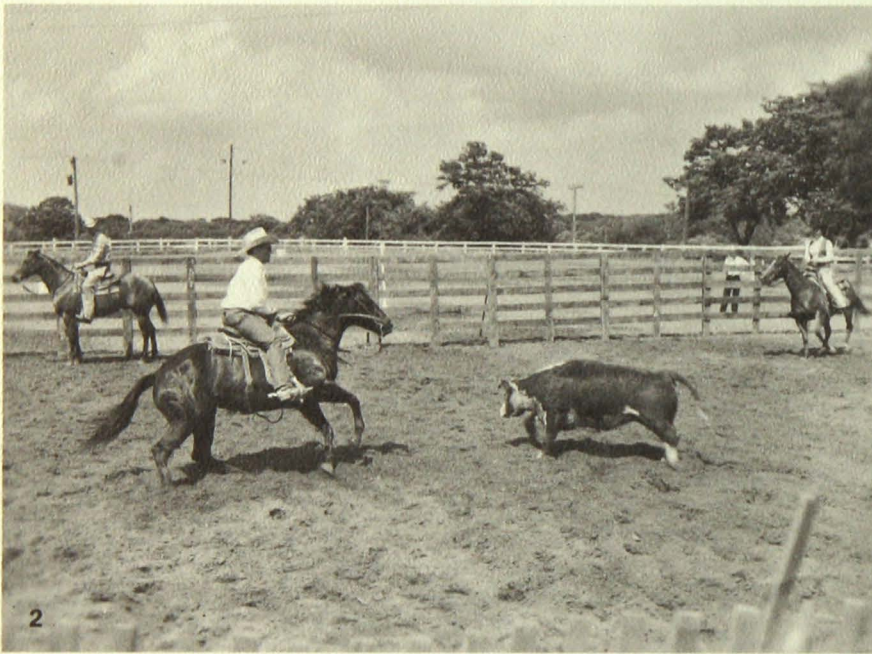
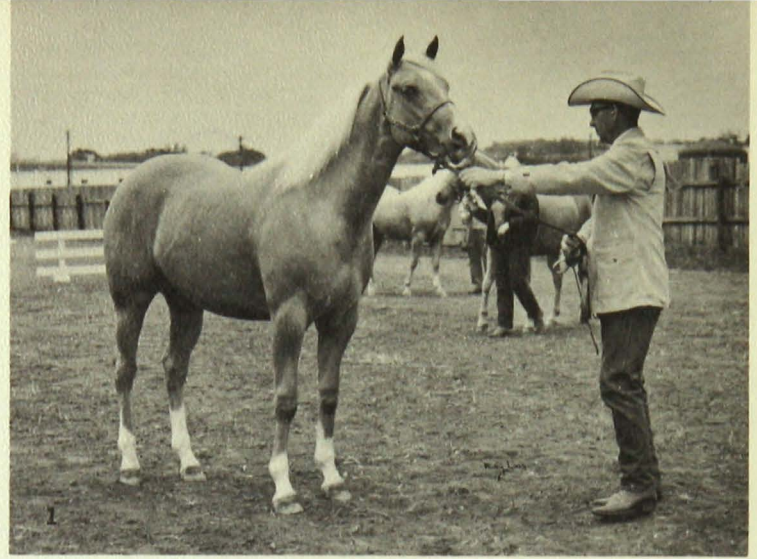
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1. Well-groomed and posed — thinned mane and foretop. The knotted lead strap detracts.
2. A 'cow horse' going on loose reins and set to move either way.
3. Barrel horse — correct lead, collected, and leaning in.
4. Four of a kind.
5. A pair of champions.
6. Pleasure class — competition makes it fun and the trophy worthwhile.

Photo credit: Ruby Loos, artist and photographer, St. Paul, Minn.



Horse Care and Management

R. M. JORDAN

Truly successful horsemen recognize three essentials in every good horse: First, the horse's genetic or inherited background; second, his environment, with particular emphasis on proper nutrition and care during his developing phase; and third, training. It would be foolish to attempt to highly train a horse if he had not inherited the necessary physical traits or disposition to become a top horse. Improper management and feeding of a well-bred horse would be just as foolish.

Extension Bulletin 348 discusses horse nutrition and feeding methods and Extension Bulletin 351, breeds, conformation, gaits, and unsoundness. This publication will attempt to outline various aspects of care, management, and horsemanship.

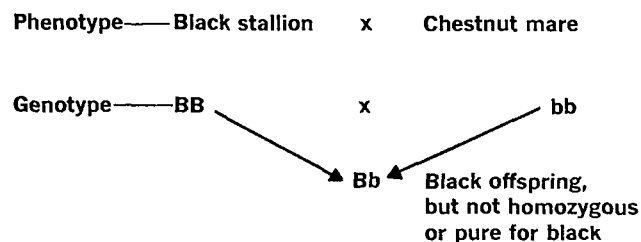
Horse Breeding

Great horses are in short supply as evidenced by the fabulous prices paid for some of the top horses. Conversely, there are too many horses of mediocre quality simply because they didn't inherit the characteristics for greatness. On the average, great horses are products of great dams and great sires coupled with proper feeding and training. Some matings that look correct on paper produce some disappointing foals, but to obtain a good foal pick the best stallion you can afford.

Anyone contemplating raising horses should have some understanding of the basic laws of inheritance and the terms used in discussing animal breeding. The foal inherits half of his traits from his dam and half from his sire. This genetic background is determined by the genes carried in each pair of **chromosomes**. Each chromosome of the pair carries one of the genes of that pair. A horse has 32 pairs

of chromosomes and in each of these chromosomes there are literally thousands of genes. During maturity of the female egg, or ova, and the male gamete, or sperm, the 32 pairs of chromosomes pull apart and instead of pairs of chromosomes, each sperm and each ova have 32 single chromosomes. At fertilization the chromosomes from the sperm and the ova unit and the fertilized ova has 32 pairs of chromosomes carrying all of the genetic material the resulting foal will ever possess. It is apparent that the dam and the sire contribute equally to the genotype the foal inherits.

When the chromosomes are paired prior to the formation of the single sperm cell or the single ova, one of the chromosomes may, for example, carry gene "B" representing the color black. The other chromosome of the pair may carry its recessive allele "b" representing the color chestnut. These genes, B or b, that the resulting fertilized ova receives from either parent are dependent strictly on chance. This is an important point to remember and explains why two full brothers may be so different in phenotype (appearance) and in genotype (combination of various genes). The following illustration may explain this more fully:



If horses with Bb and bb are mated, then ½ the offspring would be Bb or black and ½ would have genotype bb and be chestnut.

Before one can understand the essentials of successful horse breeding the following terminology should be understood.

Homozygous — When the pair of genes appearing in the pair of chromosomes is similar, such as BB, this situation is homozygous. The only gene that can be contributed is B, no matter which chromosome, by chance, mates up with the chromosome from the female.

Heterozygous — When the pair of genes in a pair of chromosomes is not similar, such as Bb, the genotype is heterozygous. When this situation exists each gene, B or b, has an equal chance of being inherited.

Dominance — A condition in which a gene dominates or covers up the effect of the other gene or allele in the pair. When a horse that is homozygous for the color black, BB, is mated with a chestnut mare, bb, the resulting genotype would be Bb, but the color of all offspring would be black. Sometimes this dominance isn't as complete as the simple example given and one will get a color or a trait somewhere between the recessive and dominant trait of the gene.

Recessive genes — These don't express themselves in the phenotype (appearance of the animal) unless they occur as a homozygous pair. In other words their expression is covered up by dominant genes. If a recessive gene is responsible for a desired characteristic, it simplifies selection since if this characteristic occurs one immediately knows that the genotype is homozygous.

Epistatic — Some genes cover up the expression of other genes to which they aren't allele or aren't of the same pair. This changes the expected phenotypic ratio but not the genotypic ratio. When a gene covers up the expression or acts dominant or modifies the expression of the other gene, it is referred to as being epistatic. This situation occurs in the expression of various colors of horses and is responsible for palomino color.

Prepotency — Prepotency refers to the ability of an animal to stamp its characteristics on its offspring. The genetic explanation for a horse that is considered to be prepotent is that its genotype is either dominant or it has a high degree of homozygosity among its genes.

Nicking — This term refers to a situation where the offspring of certain matings are outstanding, usually superior to either parent. From a genetic standpoint the situation is due to a rather favorable combination of genes contributed by both parents.

Color Inheritance — The color of a horse may reflect on a horse's value, and may be the basis for a breed, or an indication of breed purity. Dr. W. E. Castle of the University of California, Berkeley, mentions four basic genes, with their respective alleles (pairs), as the chief determiners of the more common colors of horses: First, gene B for black pigment and its recessive allele b which when homozygous, bb, results in a reddish-brown pigment known as chestnut; second, gene A for the bay pattern and its two alleles a + and a (the combination of a + a + or a + a result in a seal brown pattern while a pair of aa's produces no pattern); third, the E series governs the extension or restriction of pigmentation. The combination of EE or Ee results in the usual pigmentation and pattern as determined by the genes A and B. However, when the gene E is in combination with its allele, E^d, this results in a dominant extension or an intensification of the pigment and when in combination with gene A and B would result in a jet black horse. The second allele, e, recessive to either E^d or E results in restricted pigmentation over the body. Fourth, gene D is responsible for dilution of pigmentation and its allele d for no dilution. Here complete dominance is absent so that homozygous DD results in heavy dilution, Dd in mild dilution and dd in no dilution. The combination of Dd, resulting in mild dilution, is necessary when accompanied by other correct gene patterns for the expression of palomino color. Tables 1-3 illustrate some of these various gene combinations and explain more fully why horses of certain colors, when mated, produce foals of rather surprising colors.

Table 1. Genotypes and expected phenotypes if only the A and B gene series determined color

Genotype*	Phenotype
A — B —	Bay
A — bb	Chestnut
a + — B —	Seal brown
a + — bb	Chestnut, seal brown pattern
aa B —	Black
aa bb	Liver chestnut, uniform

* A dash following a gene symbol indicates that the gene shown may be duplicated or in combination with any recessive allele.

Table 2. Genotypes and expected phenotype if A, B, and E series are included, with no dilution gene (D) present after Castle and Singleton (1961)

Genotype*	Phenotype
A — B — E ^d —	Jet black
A — B — E —	Bay
A — B — ee	Light or red bay
A — bb E ^d	Chestnut, dark, uniform
A — bb E —	Chestnut
A — bb ee	Sorrel
a + — B — E ^d	Jet black
a + — B — E —	Seal brown
a + — B — ee	Seal brown, light areas conspicuous
a + — bb E ^d	Dark chestnut, uniform
a + — bb E —	Chestnut "brown," light areas inconspicuous
a + — bb ee	Sorrel "brown," light areas conspicuous
aa B — E ^d —	Jet black
aa B — E —	Black, uniform
aa B — ee	Black with body being lighter than mane and tail
aa bb E ^d —	Dark liver chestnut, uniform
aa bb E —	Liver chestnut, uniform
aa bb ee	Sorrel, light, uniform

* A dash following a gene symbol indicates that the gene shown may be duplicated or in combination with any recessive allele.

Reproduction

Puberty in horses and ponies is normally reached when 12 to 15 months old depending on how well they have been fed. However, most horse owners don't have their mares produce a foal until they are 3 or 4 years old. Stallions usually aren't used (and then rather infrequently) until they are at least 24 months old.

Reproduction among horses kept under semi-artificial conditions is often disappointing (40-70% foal crop). Failure to produce a foal is blamed on infertility of the mare or stallion, or poor management by the horse owner.

Infertility in stallions ranges from permanent sterility to very high fertility with rather low fertility occurring quite frequently. Some horses inherit a characteristic for being rather low in fertility. Some horses lack libido because they are either too fat, lazy, refuse to take exercise; or at the other extreme are nervous, ride the fence and wear themselves out, are overused, or are in poor physical condition.

Table 3. Effect of the gene for dilution on various genotypes after Castle (1954) (1961) and Castle and Singleton (1961)

Genotype for A, B, and E	Observed color with different combinations of genes for dilution		
	DD	Dd	dd
Blacks:			
A — B — E ^d —	Black	Black	Jet black
a + B — E ^d —	Black	Black	Jet black
aa B — E ^d —	Black	Black	Jet black
aa B — E —	Perlino	Mouse	Uniform black
aa B — ee	Perlino	Grullo	Black, body lighter than mane and tail
Browns:			
a + — B — E —	Uncertain*	Light seal brown	Seal brown
a + — B ee	Uncertain*	Light seal brown	Seal brown, light areas conspicuous
Bays:			
A — B — E —	Perlino	Dun	Bay
A — B — ee	Perlino	Buckskin	Light or red bay
Chestnuts:			
A — bb E ^d — †	Chestnut, dark, uniform	Chestnut, dark, uniform	Chestnut, dark, uniform
A — bb E — —	Cremello	Palomino	Chestnut
A — bb ee	Cremello	Cream to golden palomino	Sorrel, light mane and tail
a + — bb E ^d — †	Chestnut "brown," uniform	Chestnut "brown," uniform	Chestnut "brown," uniform
a + — bb E —	Uncertain*	Claybank dun	Chestnut "brown," light areas inconspicuous
a + — bb ee	Uncertain*	Claybank dun, light	Sorrel, "brown," light areas conspicuous
aa bb E ^d — †	Liver chestnut, uniform	Liver chestnut, uniform	Liver chestnut, uniform
aa bb E —	Cremello	Light chestnut	Liver chestnut, uniform
aa bb ee	Cremello	Light sorrel	Sorrel, light, uniform

* Presumably a dilute brown color of the perlino-cremello type.

† The effects of E^d — in combination with bb and the dilutor gene (DD or Dd) has not been established definitely. It is assumed that E^d is epistatic to the dilutor gene in chestnuts (bb) as it is in blacks (B —).

Tables 1, 2, 3 credit: *Light Horse Production in Florida*. Florida Department of Agriculture. Bulletin No. 188, 1965.

A mare may fail to produce a foal or fail to conceive due to: lack of synchronization of estrus (heat) and ovulation, the production of infertile egg, and the failure of union of sperm and egg at the right time and place.

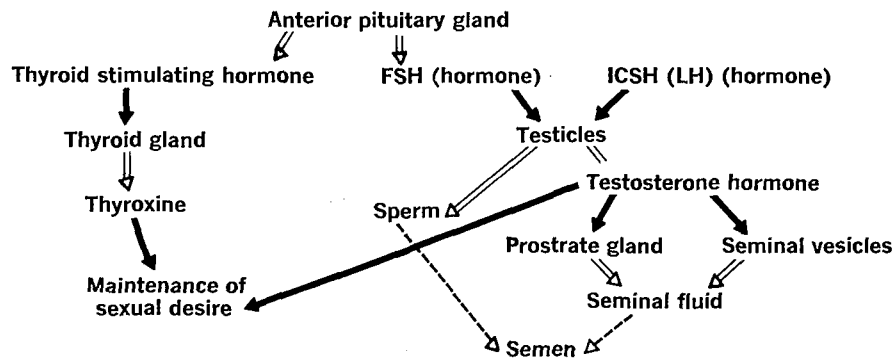
To reproduce, the egg must be fertilized by the male spermatozoa. Lack of conception may be due to: the egg's failure to pass into the fallopian tubes; the follicle's failure to develop or it develops and then regresses, or the egg's development may be thwarted when the sperm cell reaches it. The egg lives about 6 hours: the sperm must be in the fallopian tube at ovulation. Low reproduction levels are often due to mating the mare at the wrong time of estrus.

Estrus, that period when the mare is receptive to the stallion, usually lasts 3-6 days, but may persist 2-3 months. This relatively long estrus period is responsible for many mares being mated either too

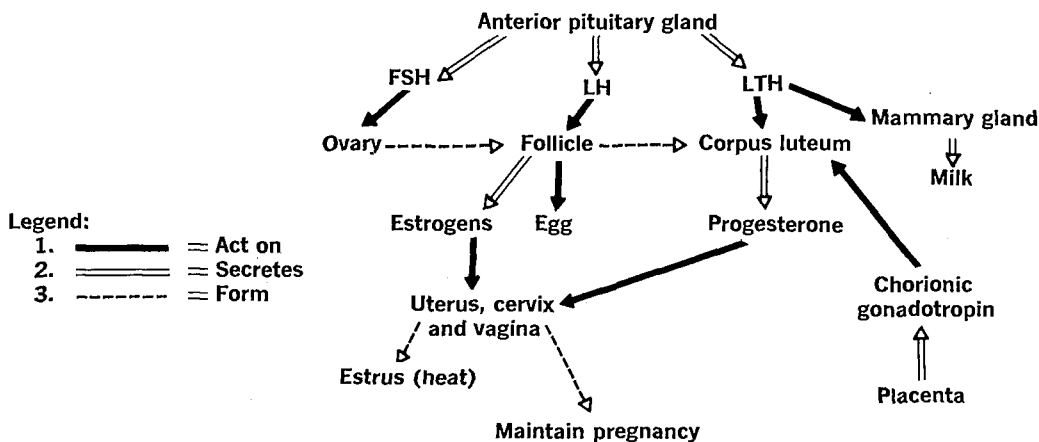
early or too late. If the mare fails to conceive at the first estrus she will return to estrus about 21 days later, though the length of the estrus cycle is also variable and may range from 17-35 days.

The variation in length of estrus period, length of estrus cycle, and the normal release and production of the ova are all dependent on a very sophisticated hormone system. The production of these hormones and their effect on the various sex glands can be very significantly affected by the season of the year (mares have more normal and regular estrus periods and therefore are most fertile from March to June); nutrition status (poor nutrition and a high foal crop seldom go together); and circumstances such as intensive training. An explanation of the hormone control of reproduction in the stallion or mare (the glands they affect and the hormones produced) are presented in figure 1.

Figure 1. Hormonal control of reproduction in the stallion



Hormonal control of reproduction in the mare



Courtesy Dr. M. E. Ensminger, *Horse Science Handbook*, 2nd Annual Publishing, Agriservices Foundation, 3699 East Sierra Ave., Clovis, Calif. 1964.

Most successful horse breeders follow these practices: they know their mares well enough to "tease" them properly and to breed the mare at the proper time. They employ a veterinarian to determine by rectal palpation when the follicle or egg is about to rupture. They breed the mare within 12 hours prior to the rupture of this follicle. They don't transport the mare after breeding and avoid breeding the mare at foal heat (usually occurs 8-10 days following foaling), and make sure that she is in a proper nutritional state and has been wormed 60-70 days prior to breeding. The large corporations which maintain valuable stallions normally hand breed the mares though the highest foal crop usually occurs with pasture breeding.

Even though the mare conceives, many foals are lost in the uterus because of injury or infection of the reproductive tract. Some mares suffer from pneumovagina or windsucking which can cause abortion. This is a situation where debris and bacteria enter the reproductive tract causing diseases which usually result in abortion during the fifth month. Some mares contract contagious abortion which is caused by bacteria salmonella abortivo-equina. This organism may be induced by the ingestion of contaminated feed or during mating. Abortion usually occurs in the last half of pregnancy, especially the seventh and eighth month. Fortunately, vaccination can prevent contagious abortion. Rinopneumonitis is a respiratory disease which can cause abortion in the seventh to the tenth month of pregnancy.

Assuming none of these pitfalls occurs, the foal will be born 310 to 370 days after breeding.

Parturition

Prior to parturition (birth) the mare should be fed and exercised so that she is in a strong, vigorous condition. Table 4 presents acceptable rations to feed pregnant and lactating mares.

About 2-6 weeks before foaling, the mare will develop a distended udder and within a week of foaling the mare usually shows a marked falling away of the muscular parts of the croup. The vulva is dilated and the abdomen of the mare very distended. While the udder may be distended, the nipples usually are not filled until about 4-5 days before foaling and drops of wax appear on the end of the nipples generally 2-3 days prior to foaling. Milk may drop from the nipples a day before foaling, but often only 4-5 hours before foaling.

The best place for a mare to foal, assuming the weather is moderate, is on pasture. This will alle-

viate many of the problems of infection encountered with foaling. If this isn't possible, the mare should be in a large, roomy box stall a week or 10 days before foaling so she becomes accustomed to it. It is extremely important to establish sanitary procedures around a foaling mare to avoid troubles varying from naval ill of the foal to diarrhea. The stall should be well-bedded, dry, free from draft, and kept clean.

The labor pains of a mare are violent and she normally foals quickly. Usually it is not more than an hour from the time the mare starts to labor until the birth. Inform your veterinarian at the onset of labor so that he can come quickly if problems arise. If the afterbirth isn't expelled within 4-5 hours, call your veterinarian.

Table 4. Suggested rations for pregnant and lactating mares

Ingredients	Concentrate mixes (percent)*		
	No. I	No. II	
Corn	25	30	
Oats	45	45	
Bran	20	20	
Soybean or linseed meal	8	3	
T.M. salt	1	1	
Dicalcium phosphate	1	1	
Vitamins	yes	yes	
A-1,000 I.U.† per pound			
D-200 I.U. per pound			
Protein content	14	12	
Amount to feed daily, pounds			
	Concentrates	Alfalfa	Brome or timothy
Pregnant mare (last 3 months)			
600 pounds	1	4	8
1,400 pounds	1.5-2.0	8	12-14
Lactating mare			
600 pounds	5	3	7
1,200 pounds	9	5	14

* 5 percent molasses replacing either 5 percent of the corn or oats will help control dust and increase palatability. Feed mix II if feeding alfalfa hay.

† I.U. = international unit.

After foaling, give the mare a small amount of lukewarm water and a laxative feed such as wet bran and good quality hay. Don't overfeed the mare during the first 4-5 days. This will help to alleviate excessive milk flow and intestinal disorders. Dip the navel of the foal in iodine shortly after birth to minimize infection through the umbilical cord. Usually the foal will be up attempting to nurse within 2 hours after birth and, if not, it may be necessary to give some assistance. If the foal fails to nurse within 4-5 hours, give it some of the dam's first milk in a bottle. Be observant of the foal and the

mare; abnormal bowel movements of either should cause concern. In colts, constipation and diarrhea (scours) are common.

Diseases and Parasites

“A little knowledge can be dangerous” often applies to horse people who attempt to practice “do it yourself” medicine. The first requisite of a good livestockman is to recognize at an early stage any abnormal condition indicating the horse is uncomfortable or in the early stages of sickness. This is a talent some seem born with, others are able to acquire, and some are oblivious to. The ability to observe is a necessity for success.

A sick horse usually hangs his head, loses the bright expressiveness of eye, his ears may droop, he stays to himself and is reluctant to move; he may have abnormal appearing feces, suddenly changes eating habits (quits eating and drinking altogether or increases water intake excessively); acts uncomfortable, is nervous, twitches the tail excessively, lies down and gets up frequently, sweats, coughs, has a nasal discharge, a rapid shallow breathing, trembling, and excessive stomping of the feet.

All or some of these symptoms could appear with any one of a dozen diseases or conditions. The first step, if possible, is to confine the sick horse in a small area away from other horses and make him as comfortable as possible. This would mean shade and cool water in the summer; a blanket, shelter from wind, and ample bedding in the winter. Take his temperature with a rectal thermometer. A normal horse's temperature ranges from about 99° to about 101° F., the normal breathing rate is 8-16 respirations per minute. This information should be given to the veterinarian when you call.

Horse diseases may be classified as infectious, caused by bacteria or viruses; and noninfectious, nutritional disorders (rickets, founder, azoturia, colic) or poisonings, (lead, plant, and insecticide). Each can kill a horse, though infectious diseases give more concern since they may infect other horses.

The way to control infectious diseases is to prevent contact between the horse and infecting agents. A toxoid or a bacterin can increase the horse's resistance to a specific disease. Some species have a natural immunity to certain diseases that trouble other species. Some acquire a passive immunity, such as a foal acquiring some passive resistance from antibodies in the colostrum in milk. The best immunity is provided by vaccination with killed bacterin, toxoids, or modified live viruses.

Some diseases are seasonal. For example, equine encephalomyelitis or sleeping sickness could be eliminated from the suspect list of diseases if the condition occurred in winter. Some diseases are rather specific to foals. Vitamin A deficiency could be eliminated for example, if the horse goes out on good green pasture; calcium deficiency, if the horse is fed good quality alfalfa hay.

While a horseman should be informed about various ailments, he should recognize that the diagnosis of the various diseases, particularly the infectious diseases, calls for a good deal of experience, knowledge of epidemic diseases current in the community and, sometimes for tedious and painstaking laboratory tests which can be supplied only by your veterinarian.

To aid in recognizing and knowing their seriousness, some common diseases and their symptoms follow.

Diseases and Health Problems

The foal

Retained Meconium (foal impaction or constipation). Meconium is the waste material which accumulates in the lower bowel of the fetus during gestation. Occasionally this mass, which occupies the last foot or two of the large intestine, isn't passed.

Signs — Impaction is easily recognized, the foal twitches his tail, strains, and acts colicky.

Treatment — Your veterinarian will give the foal an enema (1-2 quarts of warm, soapy water).

Sleepers or Shigellosis. Shigellosis is caused by acute septicemia resulting from the bacteria *Actinobacillus equirulis*. This organism may enter the foal through the navel after foaling or originate from a uterine infection.

Signs — If the foal is born with the infection he is usually very weak and often stillborn. If the infection occurs after birth, the foal becomes very weak and sleepy within 24 hours, refuses to nurse, and soon becomes too weak to stand. If the foal does survive, the infection usually locates in the hocks and knees.

Treatment — Antibiotics such as dihydrostreptomycin and treating the navel immediately after birth with iodine may prevent this infection.

Streptococcosis. A bacterial infection that may occur from uterine infection or via the navel, usually becomes apparent 4-8 weeks after birth.

Signs — The navel swells and becomes abscessed and the foal develops a very high fever. Diarrhea

usually accompanies the disease and the fetlocks, hocks, and knee joints swell and are very painful.

Treatment — Penicillin should be used at the earliest sign of infection.

Navel Ill. Navel infection is usually caused by *E. coli*, *Salmonella abortusovae*, *Corynebacterium equi*, and other bacteria that enter through the navel. The navel and usually the joints are involved.

Hemolytic Icterus or Jaundiced Foals. The cause is the incompatibility of the foal's blood to the antibodies in the colostrum (milk) of the dam. This situation is a little similar to the Rh factor in humans. It arises when the mare is bred to a stallion with a different blood type and the foal inherits the blood type of the sire. It usually occurs with the second or third foal from this incompatible blood type mating. Some of the blood cells of the foal enter the dam's circulation system and the dam develops antibodies against them. The colostrum, therefore, contains high levels of these antibodies and when the foal nurses and the antibodies are absorbed, they cause clumping and breakdown of the foal's red blood cells resulting in anemia.

Signs — The foal becomes very weak, nurses infrequently, has a rapid, weak pulse and respiration, and jaundiced eye and mouth membranes.

Treatment — A transfusion of compatible blood may be necessary. If the mare's blood is known to be incompatible, the situation can be avoided by preventing the colt from nursing from the dam. After 2 or 3 days the colt's intestinal tract stops absorbing these antibodies which are protein and icterus doesn't develop. It is not a frequent problem.

Diarrhea or Scours. These may be caused by bacteria within the intestinal tract, secondary infection, and nutritional scours. Foal heat scours occurs usually at age 7-10 days and when the mare comes into foal heat. Spoiled feed may affect the mare's milk or an infection in the udder may cause scours in the foal.

Signs — The foal heat diarrhea is usually accompanied by a fever. The foal may refuse to nurse and becomes dehydrated.

Treatment — Sulfas, antibiotics, and anticholinergic drugs which reduce intestinal motility or a mild laxative may be used to rid the gut of the offending toxins. Sanitation will often prevent scours. It is a good policy to milk the mare out during foal heat so the foal doesn't get too much of this concentrated milk.

Nutritional and Noninfectious Diseases

Azoturia, Tying-up Syndrome, or Myoglobinuria. This condition is associated with high energy rations fed to horses whose work or exercise is reduced, but whose feed isn't. The carbohydrate in the grain is stored in the muscle as glycogen and when the horse is used, the muscle glycogen rapidly breaks down to lactic acid which causes muscle damage.

Signs — Azoturia occurs 15-30 minutes after the horse is exercised. The gait is choppy and stiff and the horse is restless. If exercise continues the horse will go down on his rear haunches and finally on his side. Sweating is profuse and the muscles of the croup and thigh become extremely hard and sore.

Treatment — Injections of selenium, vitamin E, sedatives, and laxatives may be helpful. Prevention: reduce the grain allowance when the horse isn't being used.

Colic or Severe Abdominal Pain

Spasmodic Colic. Due to spasms of the intestine and primarily of nervous origin.

Gas Colic. Due to moldy feed or other gas producing feed.

Impaction Colic. Due to obstruction of the gastrointestinal tract which occurs when the feed in the digestive tract becomes dry and dehydrated.

Displacement Colic. Due to twisted or telescoped intestines resulting in strangulation of the intestine.

Verminous Colic or Thromboembolic. Larva forms of blood worms cause a dilatation of the anterior mesentery artery impeding blood circulation to the intestine.

Urinary Colic. Calculi stones may form in the kidney or urinary tract stopping the flow of urine.

Horses of all ages have colic and it seems more prevalent during the winter when the supply of water may be less liberal and is less often seen on pasture.

Choke. Obstruction of the esophagus due to too rapid eating or bolting of grain and often when medicine in bolus form is given.

Laminitis or Founder. Laminitis is an allergic type of disease resulting in damage to the sensitive lamina of the hooves. There is inflammation of blood vessels of the hooves and an elevated level of blood histamines. Laminitis can be caused by a variety of circumstances:

Overfeeding, particularly of grain or fresh grass.
Excessive cold water when the horse is warm.
Foaling, retained placenta, or infection.

An imbalance of hormones, either natural or following an injection.

Road founder, occurring when the horse is ridden on a hard surface. Overweight ponies and horses seem most susceptible to founder and after horses have founder they are more susceptible to recurring attacks.

Signs — The horse is lame, usually only in the front feet, and attempts to put most of his weight on the hind feet. If all four feet are involved, the horse lies down. The feet are warm, as is the coronary band; pulse rate is increased and, if pressure is applied to the toe, the horse shows extreme pain.

The chronic form usually referred to as founder, rather than the acute laminitis, develops more slowly. The sole may drop and often the coffin bone rotates within the hoof, pointing downward. The hoof grows irregularly, the toes become excessively long and the hoof wall will have ridges or rings around it. Often the wall will separate from the sole (seedy toe) admitting foreign material and infection.

Treatment — Anti-inflammation drugs and antihistamin drugs, along with a mild laxative such as mineral oil is used to aid in passage of excess feed. In acute cases, the horse's feet are placed in cold water or mud for about 20 minutes, then exercised 10-15 minutes, and stood in cold water or mud. This treatment is repeated about every 3-4 hours for a week or 10 days until the pain and fever have left.

Your farrier may cut grooves in the wall of the hoof and it is imperative hooves be trimmed regularly. If the coffin bone has rotated downward, lowering the heel will provide a flatter surface and lessen pressure on the end of the coffin bone. It's a condition to avoid.

Heaves (Chronic Pulmonary Emphysema). Heaves is an allergic condition in which the alveoli of the lung are ruptured making it very difficult for the horse to breathe. The air, normally exhaled with the collapse of the chest, must be forced out by supplemental thoracic and abdominal contractions resulting in the heave line (visible on the lower sides).

Avoid feeding dusty feeds (the reason legume hays are often scorned by horsemen). Keep the horse on pasture or feed pelleted rations to help alleviate the condition; but this will usually not correct it after it has developed.

Roaring. Roaring is paralysis of the vocal fold in the larynx. As the air is exhaled, the fold vibrates causing the roaring sound.

Eclampsia or Lactation Tetany. This is an acute deficiency of blood calcium: lactating mares are most susceptible to it. It usually develops during the time of foal heat. Prolonged shipping may predispose a horse to Eclampsia.

Signs — The mare begins to sweat profusely, the respiration and pulse rate are accelerated, nostrils are distended, and limbs appear stiff. The muscles, especially in the jaw and shoulder, will twitch.

Treatment — The veterinarian injects the horse with calcium salts.

Rickets. This is caused by an inadequate amount of calcium, imbalance of calcium and phosphorus, and inadequate vitamin D in the diet. It is usually a disease of underfed foals or those on very heavy intakes of grain: high phosphorus, low calcium.

Signs — The joints enlarge and become painful, splints often develop, bones fracture easily. In severe cases, leg deformity develops.

Infectious Diseases

Ringworm. Very contagious disease caused by fungus and transmitted by direct contact. The hair becomes brittle and falls out and there may be a wet oozing area. To prevent it, avoid contact with infected horses, use clean combs and brushes. A fungicide treatment may be used, though it normally will correct itself in 2-6 weeks.

Sleeping Sickness or Equine Encephalomyelitis. There are two types, both caused by a virus: the eastern virus which has about a 90 percent mortality, and western which has about a 50 percent mortality. The reservoir of this virus infection is birds. It is transmitted in summer from bird to bird by mosquitos and eventually to horses. The incubation is 14-21 days. Animals have a high fever, are depressed, have ataxia, act dumb, and often injure themselves. This disease was the curse of horsemen of the '30's, but today preventative vaccines are available and should be routinely given by a veterinarian. The first time, two vaccinations about 10 days apart are given, then two annual booster shots.

Tetanus. This is a very serious disease horses are extremely susceptible to. The organism, *Clostridium tetani*, produces spores that can live in the soil and manure for years and are also prevalent in the digestive tract of animals: horses, particularly. The organism grows only in the absence of oxygen. Thus injuries, such as puncture wounds which may heal over and prevent oxygen entry, are most likely to cause tetanus infection. Anyone working around

horses should keep their antitetanus protection current.

Only about 30 percent of the infected animals that develop tetanus survive. The veterinarian would use a muscle relaxant, find the wound, remove the source of toxin, and use antibodies (to control secondary infections) and antitoxins. The best prevention is to vaccinate all horses with toxoid. After vaccination, a yearly booster shot is important.

Equine Viro Arteritis. This is a virus-caused disease resulting in degeneration of the arteries. The disease is highly contagious and may be contracted where horses are congregated (shows, rodeos, race tracks). In pregnant mares, it may cause abortion. During the early period there is a nasal discharge, eyelids are swollen and red, and the horse usually has diarrhea. There is no known vaccine, so prevention and sanitation are very important.

Equine Viro Rhinopneumonitis. This is a mild upper respiratory infection, most obvious in young animals, causing temperatures of 102° to 105° F. There is a nasal discharge which may become quite thick and coughing is common. In older animals little of this respiratory difficulty is apparent, but in pregnant mares this disease causes a high proportion of abortions usually during the seventh to tenth month. When abortion does occur, very often the fetus is still within the placenta.

Treatment — In some states vaccination with a modified live virus is used. However this vaccination should be given before the fifth month of pregnancy.

Equine Influenza. There are two types, A1 and A2. This was first isolated in the United States in 1958.

Signs — Horses run a high fever, cough, are depressed and have a nasal discharge. The symptoms are similar to Strangles; however, there is no swelling of the lymph nodes under the jaw.

Treatment — A flu vaccine (Flu Vac), two injections at 14-day intervals, are given plus an annual booster shot.

Strangles or Distemper. This is an acute respiratory disease caused by the bacterium *Streptococcus equi*, found throughout the world with the horse the only carrier. Horses are most susceptible from age 6 months to 2 years. The incubation period is 4-8 days; the onset is sudden and temperature may rise as high as 106° F. A watery nasal discharge, during the early stages, later becomes very heavy. A painful swelling of the lymph nodes under the jaw

is common. The lymph nodes try to confine the infection and very often break open and drain. Antibiotics or vaccination is the treatment. Having the disease usually gives future immunity.

Infectious Anemia or Swamp Fever. This is a virus disease affecting horses only. Flies and mosquitos transmit it from horse to horse. It has also been known to spread from contaminated surgery instruments, tattooing pliers, and needles. In this chronic disease, the horse loses weight and strength and has edema in the legs. If the anemia or fever becomes acute, the horse runs a very high fever, exhibits loss of appetite and may die.

Contagious Abortion. This is caused by the bacteria *Salmonella abortusovae*. This disease enters the horse's system through contaminated feed and also during breeding. The organism may be present in the aborted fetus, the uterus, and the penis. Abortion occurs during the last half of pregnancy, especially the seventh and eighth month. The mare often tears herself during delivery of this aborted fetus and very often retains the placenta.

Internal Parasites of Horses

More horses die directly or indirectly from blood worms (*Strongylus vulgaris*) than any other disease condition, a veterinarian has said. This means horse people should pay more attention to parasite control. An approach to the problem should be based on the following principles:

Management without a good anthelmintic treatment will not completely control internal parasites.

Parasites of any kind live at the expense of the host animal and are most severe when animals are concentrated within small areas, as is the case with most "backyard" horses.

Parasites harm horses by: (1) absorbing the food before the animal gets it, (2) sucking the blood and lymph from the animal, (3) eating the tissue of the host animal, (4) causing a mechanical obstruction in the bile and circulatory system, (5) producing nodules or tumors on the intestinal walls, (6) providing a constant irritation, and (7) providing entry to various bacteria and virus via openings in the duct wall caused by the parasites.

Horse owners should consult their veterinarian for a good parasite control program. However, they should be familiar with types of parasites and some of the anthelmintics used to control parasites. The following tables provide information about various parasites and the results of many experiments involv-

ing parasite control. Recognize that more effective anthelmintics are apt to be developed.

No single drug is effective for all types of parasites (see table 5). Parasites rank in the following order in severity and concern to the horse industry:

1. *Strongylus vulgaris* (blood worm).

2. *Parascaris equorum* (round worms or ascarids) especially harmful to young growing horses.

3. *Gastrophilus intestinalis* (Bots). The adult egg-laying fly causes much irritation and the Bot larvae produces deep pits and irritation at the point of attachment in the stomach.

PARASITE CHART

Parasite	Location in body	Life cycle	Common symptoms	Detection	Probable treatments
<i>Gastrophilus</i> (Bots)	Stomach	Bot fly eggs on legs and shoulders, hatch about 7 days after horse licks. Larvae stay about 1 month around molar teeth or mucosa of mouth — migrate to gland portion of stomach for 8-10 months. Pass in feces; pupate, and hatch in 1 month to nonfeeding adult fly.	Digestive disturbance and colic. Colts may run as if playing, then stop dejectedly.	Larvae in stool; eggs on legs, shoulders, lips, and under chin.	One month after disappearance of Bot (killing frost), carbon disulphide after 18-24 hours fasting (water available). Light feed and water 4 hours after dosage. Dyrex Anthon Parvex Equi-Verm
<i>Habronema</i> (large stomach worms)	Lining of stomach or free in stomach	Eggs or larvae ingested by house or stable fly. Fly ingested by horse or larvae from fly on lips.	Gastric irritability — poor digestion, sometimes colic; summer sores (jack sores).	Difficult — eggs destroyed by common fecal tests; larvae found in skin scrapings.	Carbon disulphide preceded by sodium bicarbonate. Organic phosphate pesticides orally. Dyrex Parvex Equizole
<i>Trichostrongylus</i> (small stomach worms)	Mucosa of stomach	Life cycle not carefully studied.	Possibly same as above.	Culture feces 5 days and identify larvae.	Carbon disulphide and phenothiazine, but difficult due to imbedding. Equizole Piperazine
Ascarids — large (30 c.m.) round worms	Intestine (larvae migrate)	Eggs very resistant: eaten by foal from contaminated pasture. Goes from foal to foal next year.	Primarily in foal. Cough, unthriftiness, loss of energy, digestive disturbances.	Mature worms easily seen from 2½-3 months on with foal.	Piperazine at 2½ to 3 months, Dyrex, Parvex.
<i>Strongylus</i> (blood worms, red worms, or palisade worms)	Adults attach to mucosa of cecum and colon	Eggs hatch from feces in 7 days — larvae (resistant) ingested. Migrate to tissues for 12 weeks. May dam up arteries, causing aneurism, stopping circulation.	Anemia, weakness, diarrhea. Aneurism interferes with circulation to intestines, then colic, intestinal stasis, twist or telescoping.	Fecal flotation.	Phenothiazine Piperazine Dyrex Parvex Equizole Equi-Verm
Small Strongyles	Cecum and colon	No extensive migration — not blood suckers. Larvae in nodules — in mucosa.	May cause ulcers in colon.	Fecal flotation.	Dyrex Parvex Equizole Equi-Verm Equigard
<i>Oxyuris equi</i> (pin worms)	Cecum, colon, and/or rectum	Female migrates to rectum.	Rubbing tail and anal region.	Eggs and worms found in yellow crust around anus.	Piperazine — follow with saline enema in 24 hours. Repeat after 3-4 weeks. Dyrex, Parvex, Equizole.

Table 5. Anti-parasitic drugs in the horse

Drug	Dosage	Bots	Ascarids	Percentage of Effectiveness				
				Strongyles			Pinworms	
				vulgaris	edentatus	small	Mature	Immature
Carbon Disulfide	2.5 cc./cwt.	90-100	50-100	0	0	0	0	0
Phenothiazine (PTZ)	2.5 gm./cwt.	0	0	0-75	0-40	0-90	0	40-50
Phenothiazine	1.25 gm./cwt.	0	0	0-40	0-20	0-60	0	X
Phenothiazine	Low-level**	0	0	95-100	95-100	90-100	0	0
Piperazines (PPZ)	4.0 gm./cwt.*	0	90-100	40-60	0-10	90-100	70-80	10-20
Parvex	4.0 gm./cwt.	75-85	90-100	40-60	0-10	90-100	70-80	10-20
PTZ + PPZ	1.25 + 4.0 gm./cwt.*	0	90-100	90-100	40-60	90-100	70-80	40-50
PTZ + Parvex	1.25 + 4.0 gm./cwt.*	70-85	90-100	90-100	90-100	90-100	70-80	40-50
Dizan + PPZ	2.0 + 2.5 gm./cwt.	0	90-100	60-80	10-30	90-100	90-100	90-100
Dyrex Captabs	80 mg./kg.	90-100	90-100	70-90	40-60	90-100	90-100	10-20
PPZ + PTZ + Dyrex	1.25 + 4.0 + 1.8 gm./cwt.	90-100	90-100	90-100	40-60	90-100	80-90	80-90
Thiabendazole	2.0 gm./cwt.	0	10-30	90-100	90-100	90-100	90-100	30-40

* Dosages of piperazine given as base. Levels of 40 mg. piperazine per pound of body weight.

** 2.0 gm. per day, 21 days per month.

X No data.

Table credit: J. H. Drudge, Proceedings 9th Annual Meeting American Association of Equine Practitioners, Lexington, Ky. 1963.

Hoof Care and Shoeing

“No foot, no horse” indicates the priority horsemen put on a good foot. Judges pay attention to the quality and health of the hoof and good horsemen keep their horses’ hooves in good shape. **All hooves need care, but not all horses need shoes.** Hoof care is a constant thing even if it consists merely of periodic visual inspection to detect abnormal growth, uneven wear, condition (cracks, splitting, foreign matter, or infection in the frog and sole), and hoof moisture condition. The frog should be pliable and the heels should flex when squeezed if the hoof has adequate moisture. During dry weather let the water tank run over so your horse has to stand in mud. This will help keep his hooves in good condition.

Hoof care should start with the foal. His feet should be picked up and examined periodically for even wear, condition of the sole, frog, and heel. This is excellent training for the colt; if you start at a young age they become accustomed to it.

Crooked legs and feet cause the hoof to wear unevenly and uneven wear tends to accentuate the severity of these defects. If a foal’s hooves are properly trimmed and rasped so he is constantly walking on a flat surface, this will help straighten out his feet and legs, or at least prevent them from getting worse. It is important to do this early before the bones have become completely calcified. Trying to straighten the feet and legs by trimming after the horse is mature will meet with little success.

Proper trimming helps a horse to move straight. A horse whose conformation results in his standing with toes pointed in (pigeon-toed) will wear his hooves off faster on the outside than inside. To maintain a straight position of the leg, the inside quarter of the hoof will have to be lowered or trimmed down. A horse that stands with his toes out and his heels in, normally wears his hooves off on the inside — the outside will be high, needing trimming. Your horse must be shod, if he is to be used on a hard surface, to keep the bottom of the hooves flat and prevent excessive wear.

Horses are shod for the following reasons:

To prevent the hoof from wearing down faster than it grows out.

To keep the hoof’s bearing surface flat and encourage a straight gait.

To correct faults in gaits such as interfering or forging. (See Extension Bulletin 351 for information on gaits and conformation.)

To relieve pain in the foot: a high heel shoe could relieve pressure on the tendons. Pressure on a developing quarter crack can be alleviated by proper shoes.

To enhance the brilliance and excellence of various gaits. A gaited horse without proper shoes simply can’t move with the height, length of stride, and hock flexion seen in similar horses correctly shod.

While shoeing is very important, a good farrier does far more than simply nail an iron bar on the end of the leg of the horse. He examines the horse

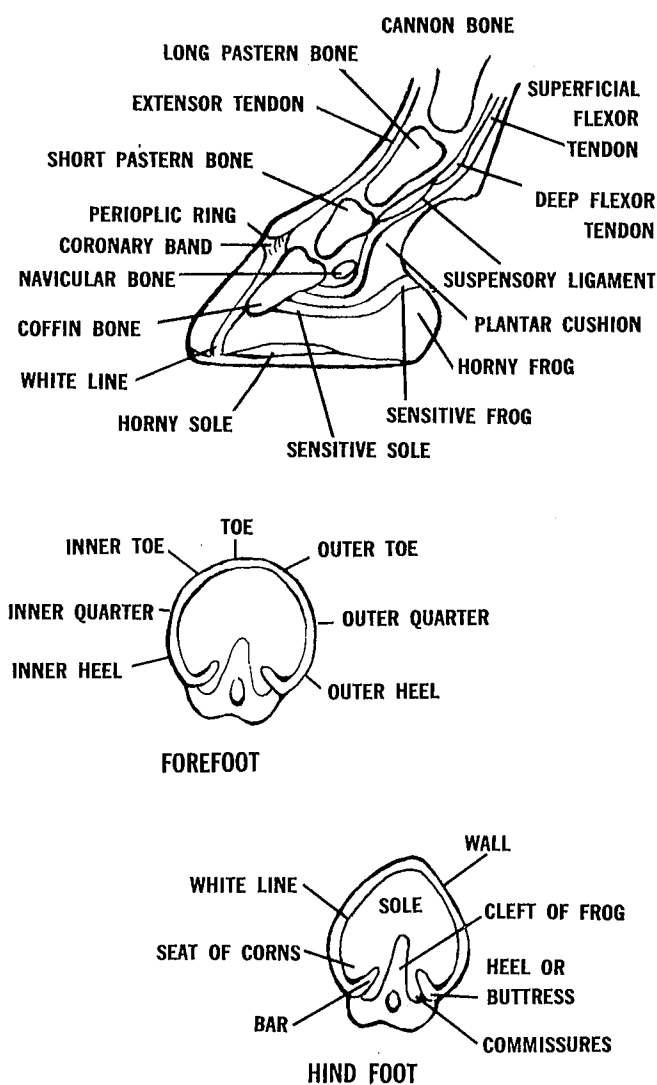


Figure 2. Hoof structure

to determine whether it stands straight and moves straight. Proper trimming is the foundation of any good shoeing job. Not only must the ground surface or the bearing surface of the hoof be perfectly level, but the angle of the hoof and the angle of the pastern must be similar to avoid excessive strain on the joints and tendons.

Figure 2 shows the structure of the pastern and hoof as well as a bottom view of the hoof. Note that the sole of the foot is concave so actually little pressure occurs on the sole. The sole is the lateral support for the wall of the hoof which is the major bearing surface. When the foot hits the ground there is contact with the heel and the frog, but the wear on these two areas isn't excessive provided the hoof wall isn't permitted to wear down excessively. Since the bearing surface is on the wall of the foot,

it follows that the shoe shouldn't have such a wide web (width from outside to the inside of the shoe) that it permits pressure on the sole. The white line (see figure 2) is the guideline for the farrier to drive the nail. If he gets inside the white line, he would be hitting a very sensitive area and the horse would be extremely lame. If he is outside the line it is difficult to drive a nail into it and the tendency to split is much greater.

Under ideal conditions the frog, that soft but rather fibrous portion of the foot, should make contact with the ground. This increases the flexion or the expansion of the hoof at the heel and prevents contraction of the heel. For this reason, a farrier won't cut down the frog. He may trim off some of the loose, ragged edges; clean out in the cleft between the sole and the frog to make sure there isn't any disease; but he won't cut down the frog or pare down the sole. The sole gradually flakes off with normal wear and development and is a very good insulator against cold and drying out. If the sole is pared down so that it gives to pressure of the thumb, it will dry out and until it has built up, will be extremely sensitive. The horse must wear shoes for if he were to hit a stone on a rough piece of ground with the sole pared down, he would immediately be lame.

Most horses, kept for recreation and not for show purposes, need shoes only to prevent excessive wear.

Occasionally a type of shoe is worn to correct a defect in the way of going, such as severe striking which causes lameness. Some basic principles are given to help you know when to ask your farrier to attempt to correct a horse's gait and to understand a farrier's work.

A good farrier knows horses, the limitations of his own skills, and through experience can appraise the chances of success in corrective shoeing better than the average horseman. The need for corrective shoeing stems from the conformation of the horse and affects the way he goes.

The initiation of either correct or incorrect movement of the horse's legs starts at the time he lands on that leg or picks it up. How he lands affects how he is apt to pick it up. A farrier can correct many faults in movement by starting at either point. If one corrects how the horse lands, this is going to help correct how the horse takes off.

Perhaps it is easiest to understand the fault caused by improper initiation of the stride. The important thing here is the breaking over of the foot and clearing it from the striding hind foot. For ex-

ample, if the horse breaks over too slowly in front, the bottom of the hoof or heel may be hit by the descending toe of the hind foot (forging). If the horse breaks over or lifts his foot to the outside he will swing the foot and leg to the outside (padding). If the breakover is to the inside, the hoof usually is swung in and may cause the swinging hoof to strike the opposite supporting front leg (interfering). As mentioned earlier, how the foot is lifted or breaks over is affected by how it lands. It may be necessary for the farrier to correct the breaking over, or take off, and the landing foot. Remember some conditions can't be completely rectified: what works on one horse may not on another. Here are some rather general corrective principles and reasons:

Increase the speed of breakover in front to prevent forging.

A shoe is fitted with a **rocker toe** (the toe turned up at a 10°-30° angle) increases the speed of breakover, allowing the front foot to clear the hind foot. Lowering the hind hoof at the heel will slow its break over and reduce forging.

Weight on the toe increases the length of stride; weight on the heel shortens the stride, but increases the height of stride.

A shoe with a trailer (a heel extended on the outside) turns the toe to the outside when it lands. Extending the length or putting a trailer on the inside of the hoof turns the toe in.

Trailers can be used only on the rear shoes otherwise you increase tremendously the chances of pulling a front shoe.

A square-toed shoe encourages the horse to break over straight and to move straight. Very often with horses that interfere, the farrier will use a square toe and remove a portion of the shoe and the hoof on the inside to provide more clearance.

Caulks or heels provide greater traction, increase the height of the stride, make the pastern straighter (thus relieving tension on the tendons) and prevent the foot from sliding forward.

A heavy shoe uniformly distributed over the weight of the shoe increases the height of the stride and knee and hock action, but adds tremendously to the work the horse must perform and causes fatigue. When weight is added to one side of the shoe the horse tends to move the foot in a greater arc.

Bar shoes are used to provide frog pressure or may be used to relieve pressure on a particular part of the hoof.

A leather pad very often is fitted between the bottom of the hoof and the shoe to prevent flaking off of the sole and permit growing out a long toe. Pads are sometimes used to relieve pressure in navicular disease.

These are just a few of the basic principles. Leave the fine points of shoeing to the farrier. No farrier can make a show horse out of a "plug," but correct shoeing is necessary for the best action. Proper shoeing enables walking horses to do the running walk and can make a Standardbred horse that normally trots, pace; or one that normally paces, trot.

Horse Training and Horsemanship

Horse training and horsemanship is dealt with in great detail in several excellent books. A good source is articles that appear regularly in various horse magazines. These comments will be confined primarily to principles rather than detailed descriptions of horse training.

There are two schools of thought on the best way to convert an untrained, half wild animal into one that responds to man. One theory operates on force — overpowering or breaking the horse to lead, ride, or drive. The other operates on the principle of conditioning, taming, and adjusting the horse's disposition to accommodate man. Obviously the principles employed in one school very often are used to some extent in the other. The man who trains or "breaks" a horse by overpowering him is usually working with 3- to 5-year-old horses and takes less time to train the horse. Man's authority over the horse is the hallmark of that system. The other system of taming and conditioning the horse to man takes considerably longer and usually this type of trainer will start when the horse is a yearling. Most trainers agree to many of the same principles:

Don't break the horse's spirit and willingness.

Don't create any bad habits.

Don't abuse the horse.

Use authority when necessary: the rider should master the horse, not the horse, the rider.

Correct the horse's faults promptly.

Make certain the horse knows what is expected of him.

Realize repetition is the way a horse learns.

Constant repetition or too long training lessons bore a horse. For example, an over-schooled roping horse often anticipates when the rope is to be thrown and stops before the rider gives the command. A horse trained to do the figure 8 may, if overworked, become a little hard-headed since he anticipates the turn.

Use good equipment. A horse, being halter-broken and tied with a halter or strap that breaks, learns that by lunging back he can escape. A proper fitting saddle is important; perhaps a tiedown or running Martingale should be considered, but the most important part of the equipment is the bit.

One can sense that "taming" or "training" a horse is really a combination of conditioning the horse and rider and few horses become well schooled when improperly ridden and improperly reined.

Let's trace the logical training steps for a 5-6 month old foal as he progresses to a finished horse.

Halter Breaking — This training can't begin too young. In Kentucky, foals are fitted with halters and encouraged to lead when a few weeks old. Use a strong halter and a stout rope when the foal is first tied. Tie him slightly above the height of his withers to avoid entanglement in the rope. In a short time he realizes the halter won't break and he is confined. Someone should be there to prevent any accidents and to quiet and reassure him. Generally, three or four sessions of being tied takes the fight out of the foal.

Teaching to Lead — The next step is to teach the foal to lead. Merely pulling on the halter won't encourage the colt to move forward. However, pulling sharply to the right, then to the left will get him off balance and make him take a step. Lead him beside his dam at first. Another trick, put a loop over his rump and have it fall just above his hocks, run the end of the rope through his halter, and apply intermittent tension. Don't expect perfection the first or second time.

With the halter breaking and training to lead, should go a daily brushing and an examination and handling of his feet. These practices started at 2 to 3 months will help quiet the horse, make him accustomed to the handler, and it's much easier to handle his feet and legs later on. The main thing in

training a foal is to teach respect and obedience, without fear. A horse that is afraid often acts in very unpredictable ways and can be dangerous. Lessons learned as a weanling will be remembered and make later training easier and safer.

Bitting — When the horse is 1½-2 years, he should be introduced to the bit in a gentle way. The last thing to do is to jam a big heavy bit into his mouth and expect him to back and turn at command. Tie a straight or jointed snaffle bit to the halter and let the yearling mouth this bit for an hour or so at a time. This would be continued for a week or two. Then teach the yearling to flex at the pole (bend his head down so that the forehead is almost perpendicular to the ground). This is done by tying reins to a surcingle around the heart girth of the horse, or if the horse has been introduced to the saddle, tying the reins to the cinch ring on each side of the saddle. Some trainers use part elastic, others, regular leather reins. Teaching the yearling to flex at the pole is a gradual process: at first the reins should be relatively loose and then tightened up slightly each day. Keep the colt in the bitting rig for 1-2 hours a day. Continue the daily brushing and leading sessions so that he won't forget what he learned as a foal. Avoid exciting the horse, gain his confidence.

Longeing — Provides good training as well as essential exercise. Don't tie the longe line to the bit ring.

Driving — Ground driving provides additional help in acquainting the horse with the bit. Reins are fastened to the rings of the bit and the driver walks behind the horse and uses relatively long reins. This not only teaches the horse to go forward, stop on command, turn right or left, but teaches motion coordination and flexion at the pole. After the horse has been taught to stand and lead, a 15-30 minute per day training session is adequate.

The next step, particularly with gaited horses, is to hitch him to a cart. Pulling a cart will "leg him up" and put the finishing touches on his reining. Ankle chains (4-6 ounces) encourage the horse to pick up his feet and aid in developing shoulder muscles.

Sacking Out — Most people want a responsive horse, yet one who doesn't shy at everything. Sacking out is the training session that eliminates shying. The procedure: place a loop (use a 1-inch soft cotton rope) over the neck of the horse, then a small loop around the pastern of one of the hind legs,

raising the hind foot off the ground so that it is impossible for him to get his weight on that hind foot and tie it up by fastening the rope to the loop around his neck. This is a very effective way of restraining a horse, yet not frightening him or permitting him to hurt himself. The next step is to slap him gently all over with a gunny sack or a pair of pants. This "sacking out," if repeated two or three times, is very effective in conditioning the horse to handling and eliminates just about all his fright. Attempting to "sack him out" without raising his hind foot increases the chance of horse and trainer getting hurt, breaking equipment, and forming bad habits. This sacking out principle is used on almost all well-trained quarter horses, trail horses, and some gaited horses.

Saddling — If these steps have been followed, saddling should be a simple procedure. Introduce him to the saddle blanket, slip it over his back, constantly petting and talking to him. Place it a little forward on the withers and then pull it back so all the hairs lie straight. Then put the saddle on gently. This doesn't mean flopping it over his back, hitting him with the cinch rings or the stirrups. It is best to have someone help. If the horse refuses to be saddled this may become a habit or vice. The first few days, all the horse should carry is the saddle and he should be led around to grow accustomed to this weight and the flopping stirrups. Keep his head up and do everything you can to prevent him from "pitching." If he has been properly handled up to this point, he should never buck.

After a few days of carrying only the saddle, the trainer may mount. Some trainers merely put their weight in one stirrup for the first few times and may take a day or two before getting into the saddle. Others will quietly swing into the saddle. While the ground driving and cart pulling has aided tremendously in collecting and coordinating the horse's movements and giving muscle tone, this added weight on his back is quite a different problem. The 2-3-year-old horse should be led around at a walk. Make certain he responds to the bit before being turned loose with no one at his head.

This procedure is rather standard, yet it is during this formative training that so many horses are soured or spoiled. Some horses respond quickly to training, others require longer training. It takes patience, authority, and knowing what to do and when to do it to bring a horse along this far.

The actual gentling of a horse and getting him to ride off is the simplest part of developing a top horse. The most exacting work is that of converting

a saddle-broke horse to a performance or top horse. Most amateurs don't know what they want or what is essential. It's at this stage of training that many potentially good horses are wasted.

The first essential of any good horse is collection. Collection is getting a horse to move with more of his weight on the hind quarters and raising or lightening his front end. To do this, he must flex at the pole and tuck his chin and set his head (so the profile is more vertical). Collection puts the horse's legs and his weight in a position enabling him to move quickly and easily in any direction. Obviously if a horse has more of his weight on his hind quarters he must have his hocks up under him and be in the correct lead.

A soft responsive mouth is the next essential. In fact, it's difficult to collect a horse unless he does have a responsive mouth. To develop a soft mouth, one should give and take on the reins always trying with soft tugs and pulls (never dwell on the reins) to get the horse to tuck his chin. Hence the rider's hands and a realization of how the horse is responding are most important.

Bits — One usually classifies bits by their action on the following pressure points of the horse:

Tongue — every bit puts some pressure on the tongue.

Bars — these are the sharp edges of the lower jaw which separate the front and back teeth. The groove between the bars where the tongue rests is usually less than 2-inches wide. Every mouth piece or bit puts some pressure on the bars.

Chin — like the bars, the chin is a fixed boney part on the under side of the jaw and is sensitive to pressure. Curb chains and straps, hackamores, and bosal put pressure on the chin.

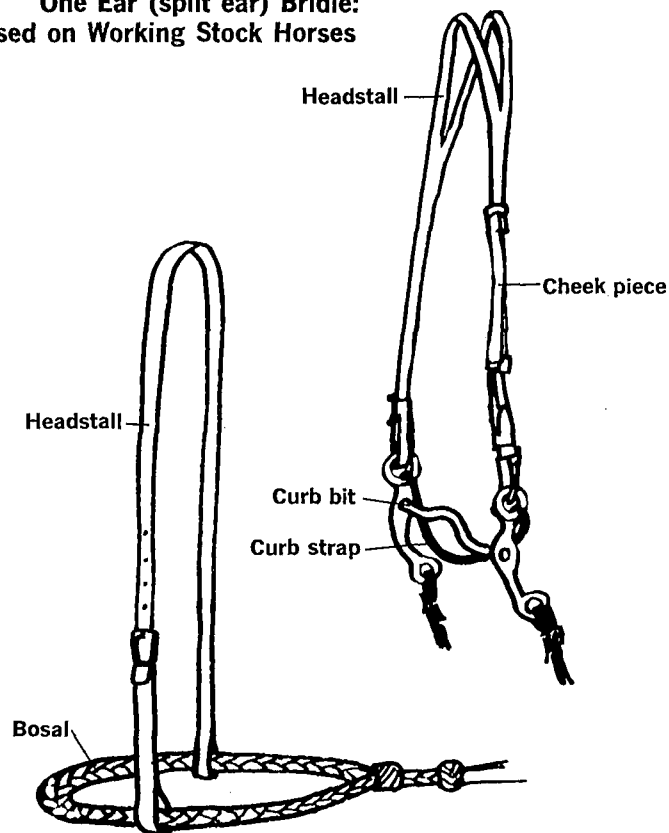
Corners of the mouth — this is soft flexible tissue. All bits affect the mouth corners but the snaffle type of bit puts the most pressure here.

Nose — any bridle that carries a noseband puts some pressure in this area.

Roof of the mouth — pressure occurs in this area from bits such as a spade bit, that have extremely high ports.

The hands of the rider govern the amount of pressure put on the various parts of the mouth, jaws, and nose, and the amount of damage that can be done to the horse's mouth. Modern bits aren't cruel or injurious, but some riders are. It is more difficult for an inexperienced rider to damage the horse with

**One Ear (split ear) Bridle:
Often Used on Working Stock Horses**



Bosal Hackamore: Popular for Breaking Horses

a snaffle bit and certainly a fine chain, used as a curb in the hands of an inexperienced rider, would be very injurious to the horse's chin. More horses are overbitted than underbitted.

While the choice of the bit is important, proper fit is equally crucial. Improper fitting of bits is probably the biggest mistake amateur horsemen make. If the skin is wrinkled in the corners of the mouth, it's a good bet the bit is too tight. Conversely, if the horse mouths the bit excessively, he is trying to spit it out, indicating it's too long. Don't use too small or too large a bit. If the mouthpiece is too narrow (width from ring to ring) this will be as irritating as a bit that's too tight.

Main Types of Bit

Snaffle — puts pressure on the corners of the mouth and to some extent on the cheeks and tongue. There is a wide variety of snaffle bits such as egg snaffle, D snaffle, twisted wire snaffle, double-twisted wire snaffle, flat ring snaffle, and rubber mouth race D snaffle.

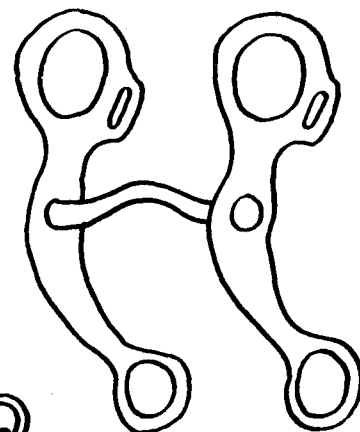
Curbs — put pressure on the tongue, cheeks, and bars.

Hackamores — put pressure on the chin and nose and to some extent the cheek. It is often used without a bit though there may be a snaffle-type bit used in conjunction with a hackamore.

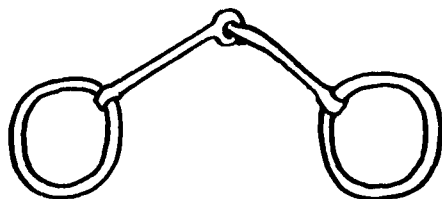
Parts of the Bit

Mouthpiece — may be straight with the pressure on the tongue and bars, or jointed with more pressure on the corners of the mouth.

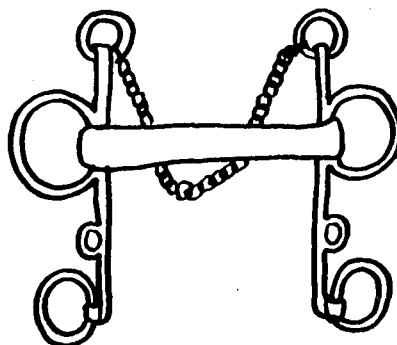
Jaws or sidepieces — such as in curb bits or the levers that put pressure on the chin and mouth. The parts above the mouthpiece are called the cheek-pieces; the parts below, the shanks. The longer the shanks, the greater the leverage.



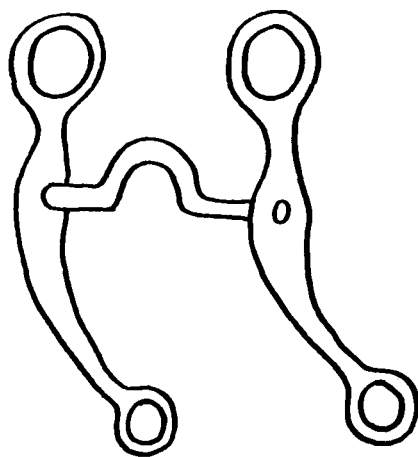
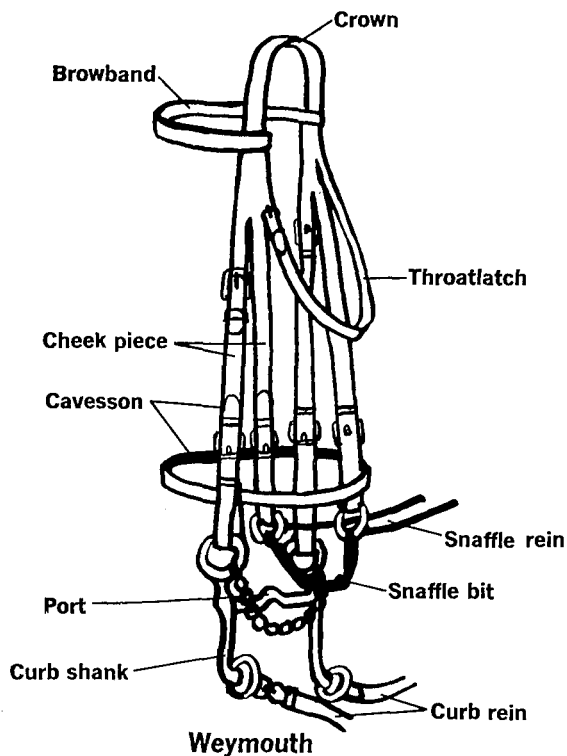
Mild Curb



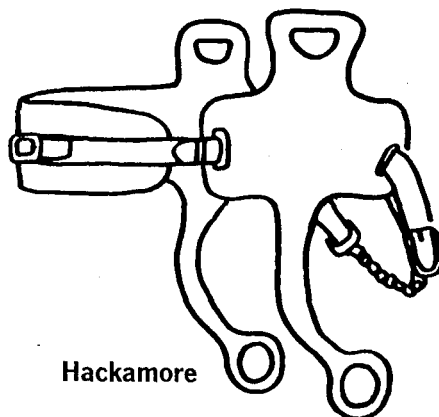
Snaffle



Rubber Pelham



High Port Curb



Hackamore

Curb Chains or Straps

These act on the chin. The chain is more severe than leather and the finer the chain the more severe. Occasionally, a curb strap will be used with a snaffle only to prevent the bit from being pulled through the mouth, not as a pressure device.

Bit accessories — the port or center piece of the mouthpiece helps keep the tongue under the bit and encourages flexion at the pole. Some have a roller or crickets, others have a spoon or a spade port which adds severity. These copper rollers, or crickets or keys stimulate saliva and act as pacifiers. Cross-bars or crosschains connecting the lower end of the shank limit the play of a loose-jawed bit.

Ring — This passes around the lower part of the jaw and is sometimes referred to as a ring bit. It helps control hardmouthed horses, keeps the bit in place, and replaces the curb strap or chain.

Use of the Various Types of Bits

Snaffle

The straight snaffle is the least severe; the jointed snaffle has somewhat of a pinching action. The larger and smoother the mouthpiece, the milder the action. Small wired, jointed snaffles are often used as one of the bits in a Weymouth bridle to help position the head and give the horse some balance and collection. Since the large smooth snaffles are relatively mild, the horse moves forward with more boldness, yet the rider maintains a constant contact between the mouth of the horse and his hands. They are commonly used on polo ponies, race horses, and as one of the beginning training bridles. A snaffle bit isn't as satisfactory for sharp precision reining as the curb. With a snaffle the control or discipline is less and it doesn't encourage a horse to flex at the pole or duck his nose, but the snaffle

is the safest and least likely to damage the mouth and particularly good for the novice horse and rider.

Curb type

A *curb bit* provides leverage and should be used on the principle of instant pressure and immediate release when the horse responds. Curb bits put pressure on the tongue and chin. Responsive mouths and smooth stops and quick turns are the result of training, not increased leverage via the curb bit. Pressure should be in the form of a quick pull not a sharp jerk. This is the type of bit called for in all Western show classes, though some excellent Western horse trainers use a snaffle bit except when they are showing.

The *pelham* is a type of curb bit which is really a combination of a snaffle and curb. One rein is attached to the snaffle ring and one attached to the curb ring.

The *double bridle* (bit and bridoon) is a combination of snaffle and curb bit with separate reins to each bit permitting the exclusive use of either bit or the combined use of both. This is a rather standard bit for three- and five-gaited horses. When pressure is put on the snaffle the horse raises his head up and back throwing more weight on the rear quarters. This permits the horse to lift his fore-end higher. Pressure on the curb bit which is fastened to the other head stall is used to make the horse flex at the pole and tuck his chin in. This type of bridle with a double head stall is referred to as a Weymouth.

Grazer is a very popular Western bit with an upward curve in the center of the mouthpiece and permits less leverage than the standard curb.

The *spade* is a heavy curb bit with a very high port capped by a spoon or spade. This bit weighs about 1½ pounds and is equipped usually with braided rawhide reins and rein buttons to balance the weight. It is used with a finished horse that flexes well at the pole and tucks his nose so that the weight of the bit hangs directly down from the head stall.

The *half breed* is a milder version of the spade. It doesn't have the copper bracelets or the spoon on the port.

There are many varied versions of the curb bits. A curb is the all-round bit for Western horses well trained first with a snaffle. In the hands of a green rider, a curb is a poor bit. A tired or angry horse is more likely to blow up in a curb than a snaffle. The

more severe curbs are subject to misuse by uninformed or eager riders because it is very tempting to put more leverage on the horse than he is trained to accept or understand.

Hackamore

The hackamore with a noseband, curb strap, and jaw or side pieces for leverage may be used with or without a mouthpiece. The sudden intense pressure on the nose is severe and should be released instantly when the horse responds to the command. The hackamore is for good riders since there is less contact between the mouth of the horse and hand of the rider. Without the mouthpiece, mouth damage is avoided. The hackamore has less precision but much more control than most bits. How severe the hackamore is depends on its construction. Hackamores are used to teach a horse to work on a loose rein and to discourage forward impulsion; the snaffle bit is more appropriate for contact riding. The hackamore trains a horse to be light and to respond to every touch of the rein. He learns to tuck his nose, flex his pole, and set his head so that he can eventually pack a bit by balancing the bit between the head stall and the rein. The hackamore, since it helps the head set, should precede a spade bit.

The *bosal*, a variation of the hackamore, may be used with a bit, helps keep the mouth closed, and is often used as a transition phase to help the horse accept the curb bit. The rider must learn to handle two sets of reins if he is using both the bosal and the snaffle.

Martingales

The pressure points normally associated with certain types of bits can be changed when used in conjunction with various types of Martingales.

The *standing* or *tiedown* Martingale is used to keep the head down, to collect and balance the horse. Regardless of the type of bit, use of a Martingale puts considerable pressure on the noseband which may vary from a smooth, wide, mild strap to wire.

The *running* Martingale is very popular with trainers of Western horses and permits the rider to determine the extent of flexion at the pole. It lowers the head, flexes the pole, and tucks the nose. However, the rider loses direct contact with the mouth since the reins run first through the rings of the Martingale and then to the bit. When used in conjunction with a snaffle bit, the pressure points move from the lips of the mouth and tongue to

the tongue and the bars. In conjunction with a Martingale, a snaffle bit would be more severe than when used without a Martingale.

Bits are used to control speed, direction, head carriage; to signal change of pace, lead, and to discipline by applying and then releasing pressure when the horse obeys. Don't use bits too advanced for the horse's training or the rider's ability. A horse with sore pressure points, such as cut bars or tongue, tends to develop faulty head carriage by trying to protect the injured parts.

Equitation

To become a truly good rider and handle your horse properly some formal instruction should be obtained. Proper riding is an art and has been described in many specific publications.

Before mounting, check your equipment and stirrup length. Knees should flex slightly when riding either a flat saddle or Western saddle and a bit more when riding a hunt seat.

English

To mount, stand on the left side, face the rear of the horse, take the reins in the left hand with the bight or end of the reins on the right side of the horse's neck. Grasp the stirrup with the right hand and give it a quarter turn toward you. Then place your left foot in the iron, take a hop or two to gain motion which will swing you around so you are facing the head of the horse and as you spring up grasp the cantle of the saddle. You are now in a standing position with all your weight on the left stirrup. Remove your right hand from the cantle, place it on the pommel and carefully swing your right leg over the horse's croup. Ease yourself into the saddle and place your right foot in stirrup. Dismounting is the same procedure in reverse.

Western

To mount a horse shown with western gear, face the left side of the horse with both reins in the left hand and placed on the wither. Turn the stirrup with the right hand, put your left foot in the stirrup, then grasp the saddle horn (not the cantle) with your right hand and mount. If the reins are split the bight should remain on the near (left) side. If a romal is used, it should be placed on the right side of the horse's neck. If the right hand is used on the reins, the romal would go on the left side and with split reins the ends would be placed on the right side or offside.

Rein Length

Too short or too tight a rein will hinder a horse's motion. Too long a rein results in lack of control especially when you try to stop. To shorten a rein place your thumb and index finger of the opposite hand on the rein that you want to shorten and then pull up the slack.

Aids

Communication between horse and rider calls for various aids or cues to direct the horse, signal a change of leads, gaits, and punishment. The natural aids are: hands, legs, body weight, and voice. Artificial aids are spurs, whip, and bit.

Good hands go with good balance, secure seat, and consideration of the horse's mouth. Normally, keep your hands low and in western classes close to the horn. Leg aids usually refer to the leg below the knee. Pressure from both legs simultaneously, urges the horse forward. Pressure from the right leg would move the rear quarters of the horse to the left or away from the leg pressure. This is the basic principle applied in dressage and is used extensively by all good riders. To properly turn a horse to the right, leg pressure should be applied on the right side and the head turned to the right so both ends of the horse work in unison.

Body weight, as an aid, is used in turning, stopping and going forward, and should be used in conjunction with the other aids. Shifting your weight in the direction you are turning, or shifting forward when you want to move out not only cues the horse, but helps him move more collectively.

The voice as an aid is not used by all riders, particularly in shows, for fear of distracting other horses and riders. It's the tone of voice that is important rather than the words.

The artificial aids reinforce natural aids, gaining the attention of the horse, promoting collection and control. All aids should be as inconspicuous as possible.

Leads

All horses should be taught to use the proper lead at the canter. When moving in a circle, as in shows, the lead should always be inside. When going clockwise the right lead is correct. A gaited horse should start to canter from a walk not a trot. In western classes, horses can move from the trot into the canter. To get a horse to take a left lead, many trainers would turn the head to the right, shift their weight to the left, and squeeze or kick gently with the right leg. Riding a horse in a tight circle forces

him to use the correct lead. In cantering in a straight line the horse should not be permitted to always use the same lead as this tires him and provides no training in the other lead.

Confidence in yourself, control of the horse, and seat balance are three ingredients of any good rider. All are more easily attained if one has proper seat, correct hand and leg position, and proper posture.

The trot should be posted in English classes but not in Western classes. When cantering or loping, maintain a close seat and go with the motion of the horse. At all gaits the rider should be alert, yet relaxed, not riding mechanically.

Showing in Halter

Showing in halter classes can be very rewarding and is standard in 4-H shows. Unfortunately the best horse or pony may not win if improperly shown. The object of showing is to present (pose and move) a horse or pony to look his very best. Preparation for a halter show starts months ahead and entails proper grooming, feeding, and training.

Grooming and Trimming

Grooming means elbow grease with daily brushings over the horse's entire body, including his legs. This can't be a lick and a promise, but calls for vigorous currying and brushing with a rice straw brush 5-10 minutes a day. A suction vacuum cleaner helps get dust out, but it doesn't stimulate the skin to the degree that daily brushing does, producing a fine, glossy coat. An ounce or two of corn oil added to the daily grain ration encourages a glossy coat.

Irrespective of breed, halter classes emphasize quality, clean-cut lines, and trimness. This usually necessitates some trimming of the long beard hairs about the nose and lower jaw. The long hair about the cannon bones, fetlocks, and pasterns should be clipped with an electric clipper. Clip with the grain of the hair and several days before the show so it appears smooth and natural.

A big heavy tail detracts from the appearance of muscling through the horse's stifle region. The tail should be thinned from underneath by plucking. Don't use a clipper unless you are fitting a horse such as a three-gaited saddle horse.

A long flowing mane can be handsome, but never does a big, thick, unruly mane add to the appearance of a horse. Such a mane makes the neck appear cresty and short and the entire beast appears lacking in quality. The foretop should be thinned, but not clipped, unless the entire mane is clipped. The part of the mane behind the ears and extend-

ing down the neck for about 6-8 inches is the only area to be clipped. Clipping in this region makes the throat latch appear trimmer, gives the impression of a longer neck, and more quality. On Quarter Horses and some Appaloosas, some showmen clip the entire mane, except for the foretop, and a small area of the mane just over the withers. The Appaloosa's tail is plucked extensively to emulate the very typical thin-haired tail or rat tail.

The outside and, with some breeds, the inside of the ears are clipped. Clipping depends on established custom in the showing and is always to enhance appearance. In most horse judge's eyes quality is beauty.

Fleshing

"Fat covers up a world of sin," but some horses especially some children's ponies are shown in an overfat condition. Conversely, an underfinished horse usually has a rough hair coat, doesn't show the bloom, and is at a definite disadvantage in the showing. Some finish on the horse tends to lengthen the croup, adds width through the stifle region, makes the back appear shorter and the chest wider.

A gutty or a big-middled horse is another disadvantage for show horses. Bulky rations high in hay or silage tend to distend the abdomen. Take his "middle off" by reducing the hay allowance by 50 percent or more and increase the grain allotment. This change in ration should be made gradually over a period of a week or two.

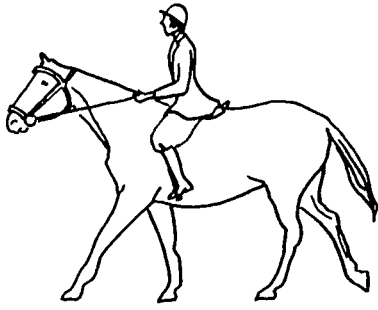
Showing

If you start with a horse of good type and conformation and you condition him so that his coat shines and he has a little fat on his ribs and a trim middle, it is up to the man who shows him to get him into the winner's circle.

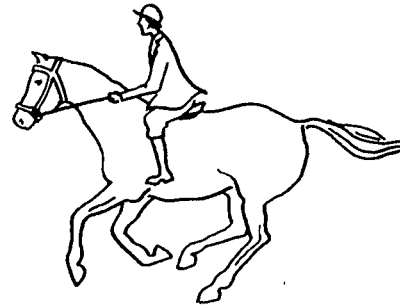
Most horse judges prefer to get an overall view of the entire class before concentrating on individual horses. This is why they will have the horses move in a large circle. Train your horse long before the show to move out with snap and life. The horse shouldn't prance, but should move with a long stride and pick up his feet and not shuffle along. Nothing is quite so distracting to the judge's eye as a lethargic, lazy appearing horse.

The judge will next appraise individual horses. You will be asked to move your horse at a walk straight away from the judge to determine how straight your horse goes. Lead from the left side, have your right hand about 10-14 inches from the

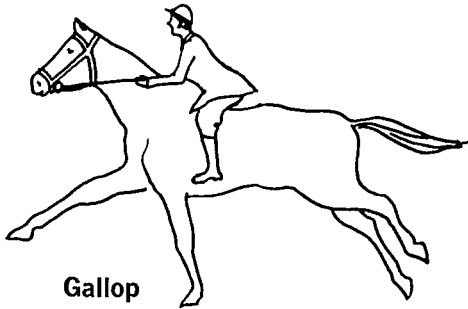
RIDING POSITIONS



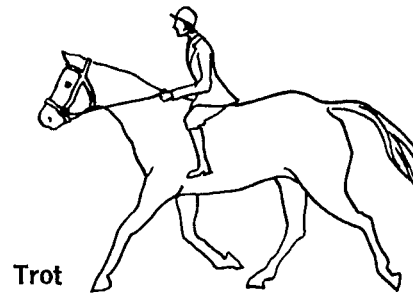
Walk



Canter



Gallop



Trot

halter and the end of the lead strap in your left hand. At a predetermined spot, stop your horse and always turn clockwise or to the right. Your horse should be backed up a step or two so that when the turn is completed you can trot straight toward the judge. Judging is hard work and most judges dislike having to move all over the ring to see how your horse moves. Hold your horse so that he shows to the best advantage (stand in front and slightly to one side, have a 12-14 inch shank on the lead strap). Don't stand them with their front feet on lower ground than their hind feet. With few exceptions most breeds of horses and ponies are posed with their heads elevated considerably above the height of their withers, ears erect, and the hind legs stretched out somewhat. Stretching out the hind legs ("park" position) makes it safer for the judge to work around the horses because the horse has to take a step forward and gather himself before he is in position to kick. The park position makes the croup more level, emphasizes the length of neck, and usually gets the neck extended and the head up in the air. The exception occurs with Quarter Horses, Appaloosas, and Thoroughbreds. With these breeds the horse again stands with his front feet on higher ground than his hind feet, with all

four feet squarely under him and the head held in a position that is only slightly higher than the top of the withers.

Some breeds are more excitable than others, but a horse or pony shouldn't be overshadowed or expected to stand in a posed position during the entire show. Have your horse showing at his best when the judge is looking and then give him an opportunity to relax and rest.

Good showmen are courteous, respectful of other showmen and follow some safety procedures such as keeping stallions or any horses that appear unruly a good distance apart. There are many tricks to make a horse show to greatest advantage. The best way to learn the subtle but very important points is to observe carefully and to make some notes on how successful horsemen fit their horses and show them.

In addition to training a horse to move properly, proper shoeing will encourage a horse to move with a little more snap, animation, and length of stride. Proper shoeing in front is particularly important and a farrier can encourage the horse to move straight with a little more flexion to his knees and hocks. There are few champion horses at halter shown unshod.

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Mention of commercial names does not imply endorsement nor does omission imply criticism.

Horse Safety Rules

The following rules are based on a survey of 13 well-known horse trainers. Most horsemanship accidents are the result of carelessness, a disregard, or ignorance of standard accepted safety procedures.

Don't startle or surprise a horse — Speak to a horse, let him know where you are so his reaction to your presence will be based on his training and experience, not fright.

Safe tack. Half worn out cinches or stirrup straps or a weak rein or curb strap can cause trouble. There is no excuse for equipment failure. Check it and try to anticipate what can happen if it fails.

Don't take a stallion for granted. They can be as dangerous as a Jersey bull and when vicious, particularly during the breeding season, can kill a man. Stud horses should be used by real horsemen not as backyard pets and trail horses. Studs can't be trusted.

Tie your horse properly. The rope should be tied to an immovable object at a level somewhat higher than his withers.

Trailer loading hazards. Teach your horse to load properly and quietly: this means practice loading the first few times in an area where he can't dodge around. The man on the leadstrap should never be in front of the horse when loading, but should get on the other side of a double trailer or pass the rope out through the front opening. A horse properly trained to load, like a force-broke retriever, knows what will happen if he doesn't obey. Trailer loading and unloading can not only be dangerous for the man but for the horse.

Mount safely. Have the reins in the left hand and the right hand on the pommel, not the left hand on the horn or pommel and the right hand on the cantle, for the horse can and often does scoot out from under. Don't put your foot all the way in the stirrup — just the toe. Make sure the cinch is tight enough.

Saddling pitfalls. Check your equipment, be sure the cinch is tight enough and that there is no foreign material on the blanket to irritate the horse.

Lead with caution. Don't get in the front of the horse: if frightened he will run over you. Watch him, lead him with a 12- or 14-inch shank.

Don't wrap the rope around your hand. Above all pay attention. Don't crowd strange horses together on trail rides, shows, or other places.

Don't show off. Attempt to be as professional as your knowledge and ability permit. Don't clown.

Don't spoil or baby horses. Be firm. Don't feed a horse out of your hand. Don't let him nip you or step on your toes. When he does things well, reward him with a pat, and encouragement. When he misbehaves reprimand him firmly.

Avoid a horse's nose. They don't like to have it rubbed.

Buy a safe horse. For the novice this means a well-trained horse, 8-12 years old: a horse that fits the rider.

Watch where you are going. Look ahead, avoid dangerous situations, and anticipate conditions just as you would when driving a car.

Excessive reining. Don't overbit a horse. Make sure the rider isn't so hard handed that he ruins the horse's mouth. Horses that rear are usually horses that are overbitted and have been yanked and spoiled.

Know your horse. Know what to expect of him, understand his moods: they vary. He may be a safe, lethargic horse one day and quite the opposite the next.

Avoid boredom. Horses very often become bored, sour, crabby, and unsafe when they are not exercised enough. A firm hand, plenty of riding, and some knowledge on the part of the rider will take out much of the sourness and avoid many unsafe conditions.