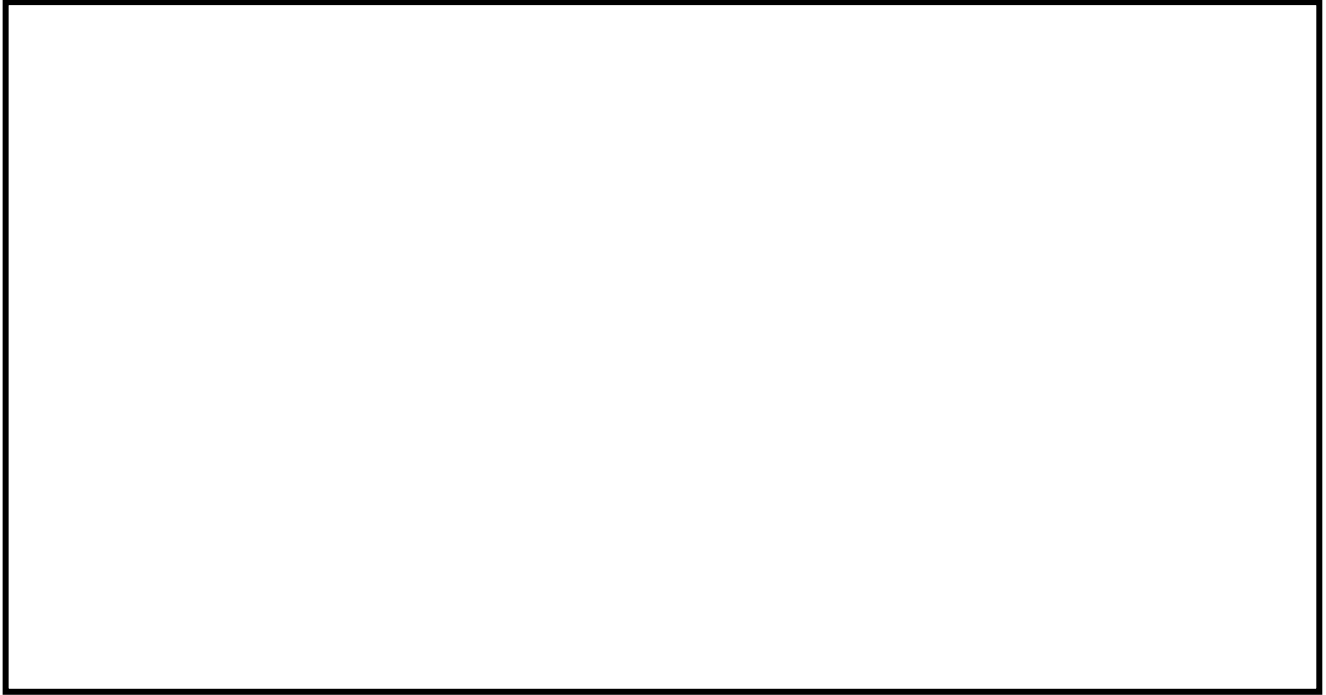


Junior 4-H Horse Project Book

(5th Year Junior)



Name: _____ Birthdate: _____

Address: _____

Town: _____ State: _____ Zip Code: _____

Name of 4-H Club _____

Club Leader: _____

Years in 4-H: _____ Years in Horse Project: _____



Targeting Life Skills Model

4-H Motto

To Make the Best
BETTER

4-H PLEDGE

I pledge my **HEAD** to clearer thinking,
my **HEART** to greater loyalty,
my **HANDS** to larger service,
and my **HEALTH** to better living,
for my club, my community,
my country, and my world.



My 4-H Story

Activities you did with your club. Different programs/clinics you attended. What you and your horse learned this year. Fun things you did. What part of your project you liked best. What you gained out of being in the 4-H program

Activities

Choose 4 activities from the list below. Please use the below space or attach your work to the back of the Project Book.

1. Observe a group of horses in a pasture. Record which behaviors are learned and which behaviors are natural. Repeat this activity for horses being ridden.
2. Go to a local horse farm or boarding stable and observe horses at feeding time in both stalls and pastures. Make notes of how horses behave prior to feedings.
3. Gather pictures from horse magazines and as a group practice body condition scoring the horses in the pictures.
4. Develop an emergency guide for each telephone in your home and/or business. Give some thought to what you would need to know quickly in case of a fire, including fires that have caused injury.
5. Observe a horse being shod and report what happened.
6. Disassemble and re-assemble both an English and a Western Bridle. Take before and after pictures.
7. Call a breed registry and find out what information is required to register with that breed., write out the information needed.

What procedures should be used to maintain horse pastures?

A healthy pasture provides horses with high quality, nutritious feed at a low cost. Pastured horses are also less likely to develop destructive habits like wood chewing and stall kicking. Finally, a healthy, good-looking pasture is appreciated by the owner and the neighbors. Sound management is essential to keep the desired plant species persistent and productive. Pastures can be improved using lime and fertilizer or by reseeding. This lesson contains some improvement and management tips for horse pastures.

CONTROLLING GRAZING The most important management aspect of pastures is to avoid over- or under-grazing. Horses are notorious spot grazers. If allowed to overgraze, horses will seriously damage desired plant species in some areas unless they are moved into new pastures frequently. Horse owners using pastures should establish some form of rotational grazing.

For rotational grazing to work, the correct number of horses per acre should be used, but the correct acreage per horse changes with the season as well as with other factors. A guideline for grazing is to provide at least one acre of good quality pasture per horse. A good rotation system will then use five or six paddocks, letting the horses graze first in one area for about one week and then changing to another and so on.

As a first step towards a rotational grazing system, horse owners may want to first try dividing an existing large pasture in half and alternate grazing each half. After gaining some experience with rotational grazing, the pasture can be further subdivided. Rotational grazing helps keep the legumes and grasses growing better and increases the feed available per acre. Rotating the horses from pasture to pasture also breaks the life cycle of some parasites.

Rotational grazing requires extra fencing and a source of water for the horses in each paddock. In some areas horses will need shade or shelter if confined to the paddock for more than a few hours.

Portable electric fencing is lightweight, inexpensive and easy to move for pasture rotation. Portable electric fencing (two to four strands of either smooth wire or wire woven into colored fiberglass webbing) is lightweight, inexpensive and easy to move for pasture rotation.

High tensile electric fencing (also called New Zealand style fencing) is also inexpensive and requires little maintenance, but is not as easy to move as portable electric fencing. High tensile electric fence fencing has five to seven strands of smooth wire spaced 8 to 12 inches apart.

Regardless of the rotational system used, grass should never be grazed shorter than 3 inches. This ensures that the grass will have enough reserves left after grazing to permit rapid regrowth.

To keep grass plants healthy in a pasture, horses need to be kept off the grass from winter until spring when grass is no longer dormant. Since grass plants are not actively growing in the winter, overgrazing can easily occur. In some areas, soggy winter soils are also easily compacted by the weight of horses, suffocating the roots of grass plants.

MAINTAINING PASTURES Maintenance procedures for horse pastures include mowing/clipping, dragging, soil testing, fertilizing, aerating and weed control.

Mowing or clipping pastures cuts all of the plants to the same height -- 2 to 3 inches. This stimulates equal growth, cuts weeds before they have a chance to go to seed, and prevents grass plants from getting too tall and tough to be appetizing to horses. At the end of the grazing season the pasture should be mowed to a uniform 4 or 5 inches.

Dragging spreads manure (horse) droppings, reducing the parasite populations by exposing them to air and sunlight. Dragging also helps to smooth over areas dug up by horses' hoofs on wet soil, makes the nutrients in the manure available throughout the pasture, and keeps the manure from smothering grass plants. Dragging can be done with a harrow or with homemade implements such as a piece of chain link fence pulled behind a riding lawn mower, tractor or pickup truck.

A soil test can indicate the amounts of nutrients (N, P, and K) in pasture soil. This will help the horse owner avoid overapplication of fertilizers and prevent fertilizers from running off the property into streams and wetlands. Fall is the best time for soil testing.

Fertilizer is applied once a soil test indicates what nutrients the pasture needs. Fertilizers should be applied only during the growing season when plants can use the nutrients. Fertilizers applied during the rainy season when plants are dormant are likely to be washed away. Applying the right amount of fertilizer at the right time can increase plant yield, improve water use efficiency, and decrease weed problems. Improved horse pastures must be fertilized annually if legumes and grasses are to persist and remain productive. The fertilizer to use depends on the pasture species present. A complete soil test every two or three years is your best guide.

Once the pasture has been grazed down, mowed down to 3 inches, and dragged, manure -- composted or fresh - can be spread on pastures to improve the health of plants and to help dispose of horse wastes.

Often compacted pasture soils are aerated in the spring or early summer when grasses are actively growing. Aerators can be rented from farm equipment suppliers.

Horse owners need to regularly survey the pasture and surrounding areas for weeds, especially noxious and poisonous weeds. Weeds can spread rapidly and push out the grass plants. Weeds sprout faster than grass at the beginning of the growing season and they are a bigger problem at the end of the growing season when grazed areas are more barren. Preventing weeds is the best weed management policy.

Good pasture management is the best weed control. Healthy grass will prevent weeds from pushing their way in and will also keep horses from being tempted to nibble on weeds. Some other weed control measures include:

- Buy weed-seed-free hay.
- Use certified grass seed.
- Mow pastures regularly before weeds have a chance to go to seed and to prevent them from shading out developing grass.

Chemical herbicides may be harmful to horses and can be very toxic to fish and other aquatic life. Also, chemicals sprayed on weeds can wash off in the rain and travel to nearby streams. When herbicides are used, the correct product for the type of weed to be controlled must be selected. When using pesticides, horse owners should always read and follow directions carefully.

PASTURE IMPROVEMENT Pastures with good stands of desirable grass and legume species need proper soil fertility combined with good management to assure good horse pasture. Yields on many pastures can be doubled simply by applying lime and fertilizer. Liming and top-dressing Kentucky bluegrass pastures with phosphate (P), potash (K) and nitrogen (N) costs much less and is less work than complete pasture renovation.

Reseeding and renovating should be used as a last resort. If renovation becomes necessary, the entire pasture may not need to be tilled if it is not completely compacted. Choosing better grass plant species for the soil than the ones already in the pasture allows the new grass to take over. The local Conservation District, Natural Resources Conservation Service, or Cooperative Extension can provide information on pasture plant varieties and a timetable for reseeding. When renovating an old pasture, the following points should be considered:

- Testing soil for lime and fertilizer requirements
- Applying required lime several months before the actual seeding
- Disking or plowing to help mix the lime evenly throughout the soil
- Selecting a seed mixture that complements the pasture drainage characteristics
- Destroying or suppressing the old pasture by plowing or using herbicides
- Using the suitable method of seeding based on the extent of tillage
- Protecting the seeded area until the new plants are well-established

Poisonous plants in pastures can be fatal to horses. Some ornamental shrubs and nightshade are common poisonous plants. Poisonous plants should be identified and removed from pastures. Many poisonous plants are not palatable and horses will not eat them unless the forage is inadequate to meet their needs.

1. A healthy pasture provides high quality, nutritious _____ at a low _____ .

Pastured horses are less likely to develop _____ habits.

2. _____ grazing helps keep legumes and grasses growing better, increases the feed available per _____ and breaks the life cycle of some _____ .

3. Grass should never be grazed shorter than _____ inches.

4. Identify the horse pasture maintenance procedures described below. Answers should be chosen from

Aerating

Dragging

Fertilizer

Mowing/clipping

Soil testing

Weed control

a. Cutting all plants to the same height:

b. Used to spread out manure:

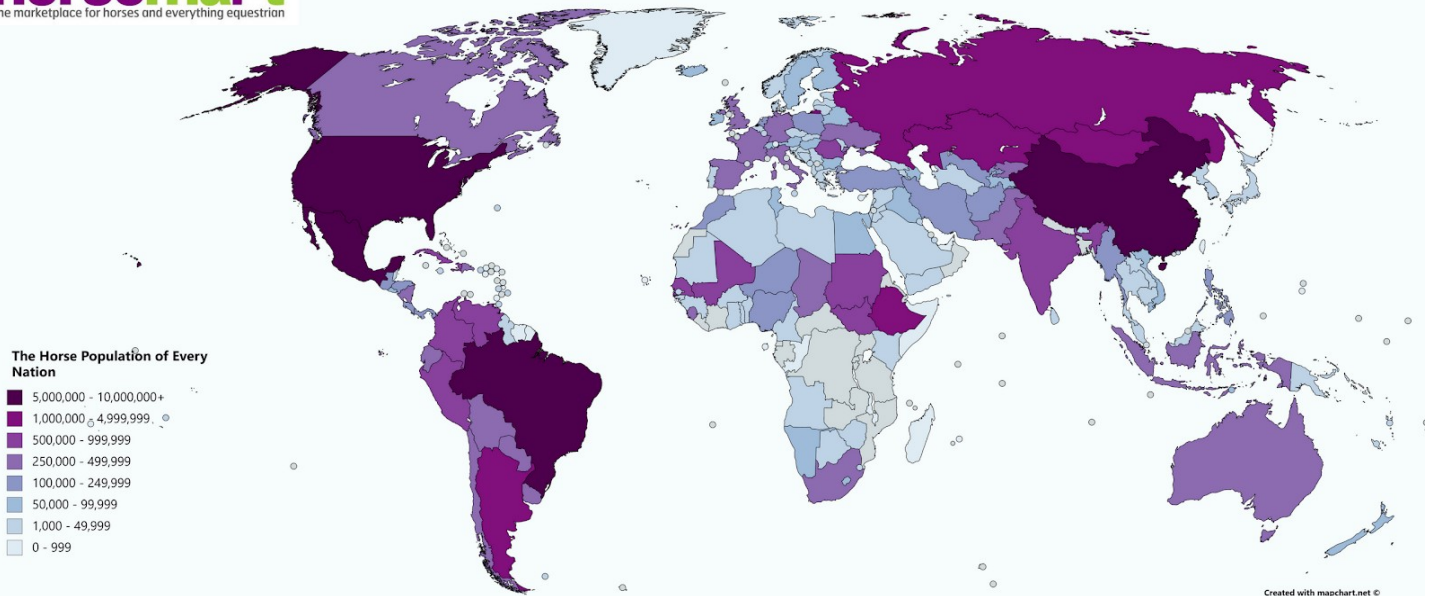
c. Indicates the amounts of nutrients in the soil:

d. Applied during the growing season when plants need nutrients:

e. Procedure used to remedy compacted pasture soils in spring or early summer:

Which Country Has the Highest Horse Population?

NATIONAL
horsemart
The marketplace for horses and everything equestrian



How many horses, donkeys and mules are found in the United States and around the world?

Rapid development and expansion of manufacturing, commerce and agriculture increased the demand for horse power in the United States during the 1800s and early 1900s. The horse population of the United States increased from about 8 million in 1867 to 21 million in 1915. As gasoline and electric power became more available and adapted to more uses, the numbers of horses in the United States declined. By 1960, the U.S. horse population was about 3 million. Since 1960 horse numbers have increased slightly and declined slightly over the years, and now the population of horses in the United States is estimated between 4 and 7 million. Reliable numbers are difficult to find.

The majority of the world's horses, donkeys and mules are not found in the United States. According to statistics maintained by the Food and Agriculture Organization (FAO) of the United Nations, only about 8 percent of the world's horses are in the United States. The percentage of donkeys and mules is even lower -- less than one percent (0.13 to 0.19 percent) of the donkeys and mules in the world are located in the United States.

Horses:

According to the statistics of the FAO, the world population of horses is about 55.3 million. More than half of the world's horses (52 percent) are found in Asia and South America. Mexico, Africa, Europe and the United States have significant populations of horses. Over the years since 1960, the world population of horses has fluctuated slightly up and down.

Recent FAO statistics indicate that the United States has 5.3 million horses. Data from the American Horse Council Foundation suggests that about 6.9 million horses are in the United States. The number of horses is not tracked by the U.S. Department of Agriculture National Agricultural Statistics Service (USDA NASS) as closely those for livestock like cattle, pigs, goats and sheep. According to the 2007 Census of Agriculture conducted by the USDA NASS, about 4 million horses are in the United States. This seems to be an increase of about 385,000 horses over the 2002 Census of Agriculture. Numbers of horses in the United States vary depending on the data source.

Some states commission their own studies on the numbers and impact of the equine industry. Often these can be found on the internet. Also, a state department of agriculture may track horse numbers in an individual state.

Donkeys and mules: Estimates show that most (80 percent) of the donkeys of the world are found in Africa and Asia, and that the worldwide population of donkeys is about 40.4 million. Only about 52,000 donkeys are found in the United States, while just south of the border Mexico has over 3 million donkeys. Of course, in many countries of the world, donkeys and horses are still used for work and transportation.

According to FAO estimates, the worldwide population of mules is about 12.6 million and most (84 percent) of the world's mules are located in Mexico, South America and Asia. The United States possesses only about 28,000 mules based on FAO estimates.

Since 1960, according to statistics from the FAO, the donkey population in the United States steadily increased from about 14,000 in 1960 to about 23,000 in 1985. Then the number of donkeys in the United States dramatically increased and now stands at 58,000. According to the FAO, mule numbers in the United States were about 20,000 in 1960. They have increased now to about 28,000.

GROWTH AND DECLINE OF THE U.S. HORSE INDUSTRY During the 1800s, the horse population of the United States grew rapidly due to the demand for horse power. The first-ever Census of Agriculture in 1860 indicated that the United States had about 4.3 million horses and over 500,000 donkeys and mules. These numbers included its territories like Minnesota, New Mexico, Oregon and Utah. By 1867, shortly after the Civil War, the number of horses in the United States was about 8 million! By 1915, the United States horse population hit 21 million.

However, the 20th century changed the world of the horse. With the steady growth in the use of new technology, the increased availability of electricity, the gas-powered engine, and World War I, the horse population in the United States declined rapidly. From 1915 to 1949 the horse population declined from 21 million to 6 million. One year later, in 1950, the population was only 2 million. By 1960 the horse population in the United States had increased to about 3 million. Currently the U.S. population of horses is between 3.6 million and 6.9 million, depending on the survey data used.

DISTRIBUTION Horses are found in every state, but the top ten horse states by numbers of horses are shown below. These rankings came from statistics included in the USDA's 2002 Census of Agriculture.

1. Texas
2. Oklahoma
3. Kentucky
4. Tennessee
5. Missouri
6. Ohio
7. California
8. Pennsylvania
9. Colorado
10. Michigan

According to the USDA statistics, Wisconsin would be very close to Michigan in number of horses. All of the states in the top ten have over 100,000 horses. Texas has 372,341 horses, twice that of any other state. There are many registered breeds and many unregistered horses in the United States. The breeds with the highest individual registrations are the Quarter Horse, with about 100,000 registered annually; Thoroughbred, with about 36,000 registered annually; and Arabian, with about 10,000 registered annually.

ECONOMIC IMPACT In 1996 the American Horse Council commissioned a study on the economic impact of horses in the United States. The data from the report indicated that horses contribute about \$112 billion annually to the economy and another \$25 billion annually in related goods and services. Further, about 7 million American are involved in the horse industry, and the industry provided about 1.4 million full-time jobs. Current estimates from the USDA NASS and the horse industry indicate 725,000 horses are involved in the race industry, 1,974,000 are involved in showing, and another 2,970,000 are used for recreation. The remaining 1,262,000 horses are used in other activities, including farming.

What and how does a horse process information?

There has long been an ongoing debate concerning why a horse does what he/she does. Some may claim behavior was because of training, while others proclaim success due to excellent breeding or genetics. Actually, both are partially correct, because behavior is a combination of both genetics and environment. Therefore the "Nature vs. Nurture" argument continues.

Environmental influences are controlled by the trainer. The trainer has to manipulate the environment in such a way as to achieve specific goals using both stimuli and reinforcement techniques. Stimuli, responses, reinforcement and their relationships to each other are fundamental to the psychology of training. Responses are the acts or movements which the horse makes. Training involves teaching the horse to make the right response. The act of stopping is a response. However, it is really the stimulus of the pressure of the bit that creates a response yielding the end product or major maneuver of the stop.

Stimuli are divided into conditioned or unconditioned categories depending on their natural effect on the horse. If a stimulus can naturally cause a response with no practice, it is said to be unconditioned. A stimulus that is learned through practice is called a conditioned response. Stimuli are known to trainers as cues which must be learned by the horse.

BASIC CUES Basic cues used in training are unnatural, and for the most part they must be learned. The trainer begins with cues that are closest to being natural. The training then advances in stages where the old, more basic cue that the horse already knows is paired with a new cue. For example, a trainer might want to teach a horse which direction to travel. The first step would be to use neck reining, which is closest to being natural. Once there is a desirable response through the bit, the next step is to add leg pressure followed closely by the bit cue.

Specific cues are presented using the horse's sensory systems of touch and hearing. Horses do respond to direct touch (nose by bosal, mouth by bits, neck by reins, etc.). However, the greater response comes from a horse's sense of hearing. Therefore, voice commands should be utilized when possible.

REINFORCEMENT Reinforcement enables certain events to be strengthened as a result of certain stimuli. Primary reinforcement refers to a natural reinforcer such as feed. However, few primary reinforcements are used in training. Secondary reinforcers are acquired over a period of time. Learning that the training period will end if he performs well is an example of secondary reinforcement.

Positive reinforcement is referred to as reward training. Any rewarding effects that secondary reinforcements have would be of an acquired or learned nature. An untrained horse does not appreciate secondary reinforcements until they are associated with primary reinforcers such as food and water. Reward training is nearly always secondary or acquired.

Negative reinforcement is aversive stimuli that the horse will work to get rid of if given a chance. There are at least three different methods of conditioning with aversive stimuli.

- Punishment is a type of negative reinforcement that occurs when a horse makes a response in the absence of a cue and then is punished upon the response. The aim is to weaken or eliminate the response. Remember, different types or levels of punishment mean different things to different horses.
 - Escape is a result of an aversive stimulus where the horse executes a specific response to get away from the stimuli. An example would involve a spur in a horse's ribs to get him to move over. The horse is making an escape response which will result in the spur being removed.
 - Avoidance responses are found in the most highly trained horses. A horse will back with light contact to avoid a harder pressure that could result with the reins.
- For any reinforcement to be effective, it must be contingent or given immediately with relation to the response AND an alternate response or the opportunity of performing correctly should be available to the horse. Contingent punishment enables a horse to know what response is being punished, whereas noncontingent punishment will cause horses to have a general fear and all behavior will be abnormal.

Shaping means behavior is shaped by reinforcing each successive approximation of the desired response. The trainer must be able to recognize small success such as backing one step, as it will lead to a good backing horse with proper reinforcement. Schedules of reinforcement refer to when and how often a horse is reinforced. Acquisition is a phase where most desirable responses are reinforced.

If cues are present without reinforcement, then the horse will make no correct responses. This is called extinction. Therefore, while continuous reinforcement represents acquisition, no reinforcement represents extinction. Between these two extremes on some intermittent schedule is where most older trained horses are reinforced to keep them performing correctly. An intermittent schedule refers to a horse that is reinforced at irregular intervals.

Inhibition is one intervening variable between a stimulus and a response, often seen with repeated practice. What a horse learns on one side, he must also learn on the other. Therefore, training must be directed at both sides or both directions. Difficulty of a task is determined by the amount of effort that is required of a horse to make a particular response. The harder it is for the horse to perform, the harder it will be for the horse to learn the response. The time and hours of practice increase as the difficulty of the task increases.

Intelligence is generally referred to as a mentality. In problem-solving intelligence tests, the horse will place low, but so will the dog. Rats, cats, monkeys and birds are animals that commonly show a higher intellect by these tests. Even the donkey possesses a great deal more reasoning power than the horse. However, the horse can best be evaluated on problems that allow them to use their skills of locomotion. Learning new tasks is not difficult for the horse if the cues involve his stronger senses. Therefore, trainers must train more toward the horse's positive assets of discriminating between the slightest of cues rather than relying on intellect.

1. An _____ response is one occurring naturally in response to a stimulus.
2. A _____ response is one learned through practice in response to a stimulus.
3. Cues are presented using the horse's sensory system of _____ and _____ .
4. _____ reinforcements are natural reinforcers such as feed.
5. _____ reinforcements are acquired over a period of training time.
6. Another name for positive reinforcement is _____ training.
7. Negative reinforcement uses _____ stimuli.
8. _____ (immediate) punishment along with an alternate opportunity lets a horse know what response is being punished.
9. Continuous reinforcement represents _____ , while no reinforcement represents _____ .

Controlling Internal Parasites in Horses

What are effective protocols for internal parasite control and prevention in horses?

Interruption of the parasite's life cycle is the "KEY" to a successful internal parasite control program. Good management practices are an integral component in destroying the parasite life cycle. Horses should be fed from mangers and troughs rather than off the ground to control exposure to infective larvae. Prevent fecal contamination of feed and water buckets by cleaning daily and providing fresh water.

STALL MANAGEMENT Manure should be removed from stalls or paddocks a minimum of once a week. It would be better to remove manure twice weekly or preferably daily. Scatter the muck on pastures grazed by cattle or sheep using a harrow to allow feces to dry and to expose eggs to the environment.

PASTURE MANAGEMENT If pastures are used, temporary pastures that are plowed up or rotated yearly are preferred to permanent pastures. The more space that is available per horse, the less chance the horse will have to eat contaminated forage. Horses put on pasture should be treated with an anthelmintic before being turned out.

DRUG CONTROL Eight classifications of dewormers (drugs) have been developed for control of internal parasites. Only one class of dewormer, avermectin, has been found to control all types of common internal parasites consistently and safely in all classes of horses. Usually a combination of dewormers is used to administer a broad spectrum of effective control. Deworming drugs differ in their ability to remove internal parasites. For example, one may control ascarids and bots, another may only control strongyle, while a third may control strongyles, ascarids, pinworms and bots. It is important to have a knowledge of deworming compounds and which parasites they control. However, the use of dewormers alone is not effective if management is poor.

There are several ways to deworm a horse. A veterinarian can pass a stomach tube and administer a combination of drugs. The advantage of tube deworming is that the dose can be given quickly so that the concentration is sufficient to kill the worms. Paste deworming is popular because of its effectiveness and ease of administration with less chance of injury. The individual horse owner can obtain and administer a paste dewormer. Feed additives can be used, but palatability can be a problem with some horses. Some horse refuse to eat feed containing the deworming medicine.

Some species of parasites have developed resistance to particular drugs, especially the benzimidazole compounds. Thus, you must be aware of the possible buildup of populations resistant to dewormer.

PARASITE CONTROL PROGRAMS Knowledge of deworming medications is extremely important in developing an effective deworming program. There is no one deworming schedule that fits all horses. Climate, humidity, rainfall, season, concentration of horses per acre, and age of the horse are all factors to consider. However, there are a few basic guidelines to follow. Most veterinarians feel that horses should be dewormed at least four times a year. This includes deworming for ascarids, strongyle, and pinworms four times per year with a dewormer that contains a boticide in the early spring and late fall. Foals should be dewormed every 30 to 60 days for the first year of life.

Deworming programs are most successful if treatments are administered during times when climate conditions are favorable for hatching of eggs, development of larvae, and transmission of infection. The annual cycle to control parasites should begin in early September and continue through February or March. One might deworm with avermectin every eight weeks, or every four weeks with another dewormer or combination of dewormers during this interval. Research indicates that there is no need to deworm during the hot summer months because little transmission occurs at this time.

1. "Continuous Use." This program consists of using the same deworming drug year after year. For example, using Panacur every year. The drawback of this particular program is that the parasites can develop a strong resistance to the drug being used. If this method is used, careful monitoring for drug effectiveness is required.

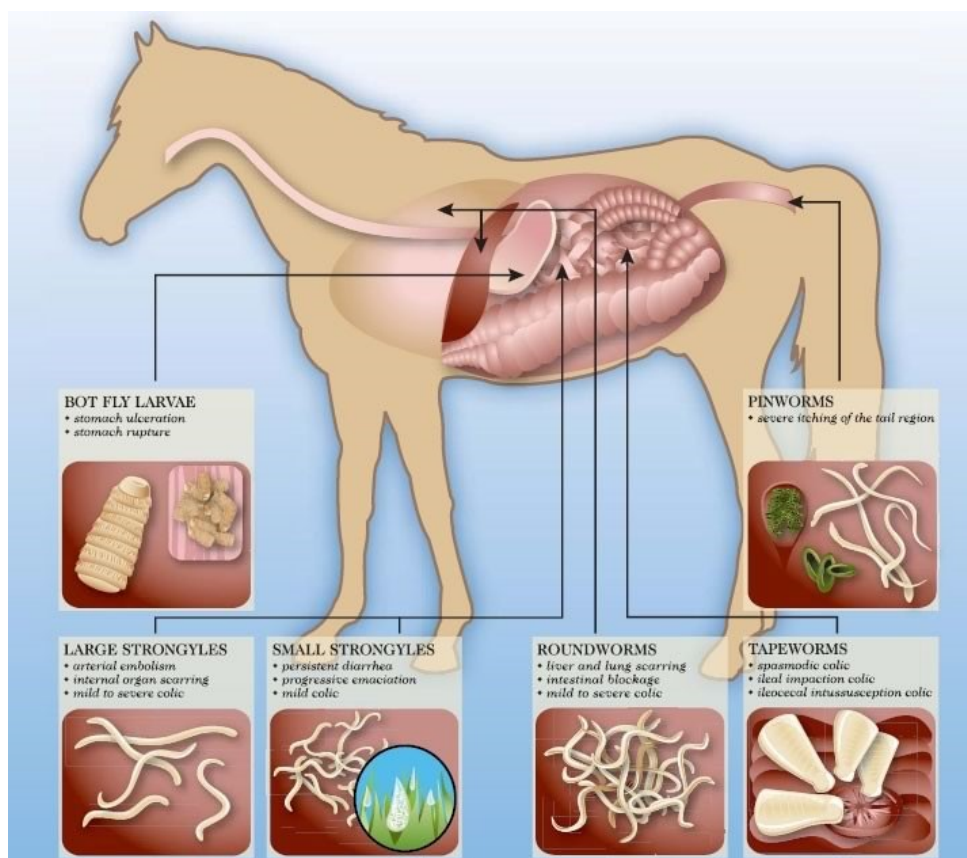
2. "Rapid Rotation." This program is the opposite of the continuous method. Different families of drugs are used every few months. This has been the standard recommendation for years and because of this the drug resistance problem worsened. In other words, it tended to accelerate the resistance to several different classes of drugs.

3. "Slow Rotation." This is the method that is generally recommended for an effective parasite control program. Slow rotation consists of rotating a different drug family every year. For example: Year one: Avermectin; Year Two: Equipar; Year Three: Strongid T or C; Year Four: Avermectin. This method is believed to slow down the development of resistance to classes of deworming drugs.

Classification of deworming medications

DRUGS			EFFICIENCY %				
Class/Trade Name	Methods+		Bots	Ascarids	Strongyle	Pinworms	Toxicosis Factor
AVERMECTINS							
Equalan	P		95-100	90-100	95-100	95-100	60x
Zymectrin	P		95-100	95-100	95-100	95-100	60x
ORGANOPHOSPHATES							
Combrot	T,P		95-100	95-100	0	90-100	1x
BENZIMIDAZOLES							
Panacur	T,F,P		0	90-100	95-100	95-100	100x
Safeguard	T,F,P		0	90-100	95-100	95-100	100x
Telmin	T,F,P		0	95-100	65-95	95-100	40x
Telmin-B	T,F,P		95-100	65-95	65-95	95-100	1x
Equipar	T,F,P		0	95-100	95-100	95-100	60x
Equizole	T,F		0	10-75	90-100	90-100	25x
Equizole-B	T,F		95-100	95-100	90-100	90-100	1x
PYRIMIDINES							
Strongid-T or P	T,F,P		0	90-100	65-100	60-70	20x
Strongid-C	F		(Prevents infective larvae from entering tissue)				

+P = Paste or gel, T = Stomach Tube, F = Feed



FECAL EGG EXAMINATIONS

Fecal examinations can easily be performed and horses treated when the average egg count indicates the need. Checking for strongyle larvae concentration is easy and can be done on the farm. The procedure is to put a fresh fecal ball in a quart jar. Place the jar, with a loose lid on top, in a dark room at room temperature for a week. Drops of condensed moisture will form on the walls of the jar. If, on daily inspection, no moisture is forming on the walls of the jar, add 10 to 20 drops of water to the jar. At the end of a week, strongyle larvae will be visible in the moisture drops on the walls of the jar with a hand lens, if the horse has the parasite. A heavy strongyle infestation will be evident if the walls of the jar have a frosted appearance.

A more complete fecal egg count exam can be performed if the horse owner receives a little training from the local veterinarian. The sugar flotation test is easy to use. Weigh a piece of feces (about a quarter of a fecal ball) and place it in a 20 cc solution of equal parts sugar and water. Stir the solution until the feces is in suspension. Strain the mixture through a piece of gauze or a tea strainer. Let the fluid portion sit for 15 minutes, and then put a few drops on a microscope slide for 15 minutes. Count eggs with a microscope using a 100 or 200 X lens with a 10 X objective lens. Counts over 1,000 per gram of feces indicate that large numbers of eggs are being passed.

1. Interruption of the parasite's _____ is the key to a successful internal parasite control program.
2. Manure should be removed from _____ or _____ at least once a week and preferably _____.
3. _____ pastures that are plowed or _____ yearly are preferred to _____ pastures.
4. A combination of _____ is used to administer a broad _____ of effective control of internal parasites.
5. There is no need to deworm during the _____ (season) months since little transmission occurs at this time.
6. A _____ use deworming program uses the same drug year after year.
7. A _____ rotation deworming program uses different families of drugs every few months.
8. A _____ rotation deworming method uses a different drug family every year.

Horse Feeding Management

How and when should horses be fed? Providing horses with good nutrition is essential for normal growth, reproduction and performance. Horses should receive feeds adequate but not in excess of nutrient requirements. However, just providing the right feeds is often not enough to ensure that horses are receiving optimal nutrition. How and when a horse is fed may be just as important as what a horse is fed. How to feed a horse includes the type of feeding system used. It involves the number and timing of meals that a horse receives. Good feeding management should encourage adequate consumption of feed with limited wastage.

HOW TO FEED HORSES In the natural state, horses are herd animals, and thus living in a group is relatively normal from a behavioral standpoint. However, competition for food within the herd may be detrimental to growing horses. The young growing horses may not be able to have access to enough feed to promote adequate growth. In those cases and in other instances it is necessary to examine alternate feeding methods.

GROUP FEEDING Many horses are kept in drylots, paddocks or pastures. When mature horses have access to adequate pasture, water and a salt block, feeding management is fairly simple. However, pasture alone is inadequate for growing horses and lactating mares. In addition, most horses that are maintained on pasture will need supplemental feed in the winter months. This can be provided in the pasture, where all horses in the field can compete for the feed. Group feeding is used in many situations, because it is labor efficient and does not require the horse to be individually housed.

One disadvantage of group feeding is that it is difficult to meet the nutrient requirements of horses whose nutrition needs may vary. For example, a yearling requires a ration containing 12 to 14 percent crude protein, whereas a mature, nongelding only requires a ration containing 8 to 10 percent crude protein. If the diet meets the need of the yearling, then it will overfeed the older horse.

Social hierarchies are often expressed most openly during feeding periods when the dominant horses may chase the more submissive horses away from the food. In this situation, it is common for the dominant horses to overeat and get fat. When the supplemental feed is a grain mix, then overeating may lead to colic and/or laminitis. The more submissive horses may not consume enough feed, so they lose body weight and condition. In addition, competition among horses at feeding time may result in injuries from kicking, biting, etc.

SUGGESTIONS FOR GROUP FEEDING

- Provide feeder space so that all horses can eat at the same time. Observe horses at feeding time and make sure all consume adequate amounts.
- Space feed tubs far apart to discourage one horse from dominating the entire feeding area. Place feed tubs in the middle of fields to avoid corners, gates, and other areas that may pose a safety hazard.
- If one horse in a group is very disruptive, remove it at feeding time.
- Place feed in a feed tub to decrease wastage.
- Group horses by physiological state (pregnant mares, yearlings, barren mares, etc.) This will decrease the likelihood of over or underfeeding.
- Observe each horse frequently to monitor changes in body weight and condition.

INDIVIDUAL FEEDING A distinct advantage to individual feeding is that every horse can receive a ration that has been specifically designed to meet its needs. It allows for maximum flexibility and monitoring of feeding and feeding habits. Generally, individual feeding also reduces the opportunity for injury due to competition for feed within a group. On the negative side, it takes more labor and time to feed horses individually rather than in a group. It also requires some type of facility where horses can be separated, usually in a barn with stalls. The horse can be housed in the barn nearly all the time or brought into the barn just at feeding time. It is not uncommon for horses fed in stalls to develop bad habits at feeding time. For example, horses may kick at partitions, walk the stall or strike the door in anticipation of feeding. Good barn and stall design can help eliminate some of the disadvantages associated with feeding horses in stalls. Stalls that allow for visual contact across a stable aisle may improve the response to individual feeding. For horses with poor appetites, visual contact with other horses may stimulate eating.

NUMBER AND TIMING OF FEEDING In pasture situations, horses may spend 12 to 14 hours a day grazing. By comparison, a stalled horse may consume a typical hay and concentrate ration in two to four hours. When diets fed to stalled horses are high in roughage, more time is spent eating than with diets high in concentrate. Since horses in stalls spend less time eating, they may be inclined to occupy their time developing undesirable stall vices or wood chewing. Wood chewing appears to occur more at night in stabled horses and is increased when low roughage diets are fed.

Horses evolved to consume small amounts of feed several times during a day, rather than once or twice a day. Anatomically, their digestive system is designed to accommodate small meals, in that the stomach is relatively small. Despite the fact that the horse is more physiologically adapted to many small meals each day, it is common for stalled horses to receive only two (sometimes three) meals in a day. This practice may be labor efficient but it may not be the most desirable for the horse, particularly if large amounts of concentrate are being fed. Horses fed twice a day may consume the concentrate portion of the meal and just pick through the hay, wasting it and mixing it with the bedding. Or, they may rapidly consume the concentrate, which could possibly lead to digestive disturbances.

SUGGESTIONS FOR FEEDING

- 1. When large amounts of concentrate must be fed to horses, divide the daily amount into at least three (preferably four to six) meals each day. Avoid feeding more than four to five pounds of grain at any one feeding.
- 2. When the hay is not fed free-choice, feed the hay before the concentrate. This practice may increase hay consumption and may encourage the horse to eat the concentrate more slowly.
- 3. When horses have poor appetites, offering food frequently may improve feed intake.

Down

1 Example of a physiological state (8)

3 Increases time spent eating (8)

4 ____ chewing is an undesirable stall activity. (4)

6 This feed should be divided into at least 3 meals/day. (11)

7 These horses may not eat enough. (10)

10 Barn divisions helpful for individual feeding (6)

12 Herd animals like to live in a _____. (5)

Across

2 A feed tub in this location could pose a safety hazard. (6)

5 Possible problem with overeating grain (5)

8 These horses may overeat. (8)

9 Should be fed before concentrate (3)

11 Natural eating method for horses (7)

13 Group feeding is ____ efficient. (5)

14 This contact may stimulate eating. (6)

15 Placing feed here decreases wastage. (3)

A crossword puzzle grid with 15 numbered squares. The grid is composed of black and white squares. The numbers are placed in the top-left corner of the starting square for each clue. The clues are listed on the left and right sides of the grid. The grid is 15 squares wide and 15 squares high. The numbers are: 1 (Down, 8 letters), 2 (Across, 6 letters), 3 (Down, 8 letters), 4 (Down, 4 letters), 5 (Across, 5 letters), 6 (Across, 11 letters), 7 (Down, 10 letters), 8 (Across, 8 letters), 9 (Across, 3 letters), 10 (Across, 6 letters), 11 (Across, 7 letters), 12 (Across, 5 letters), 13 (Across, 5 letters), 14 (Across, 6 letters), 15 (Across, 3 letters).

Understanding the Equine Hoof

The horse's hoof is referred to as the second heart. Why is this particular anatomical feature of such importance?

The hooves of a horse serve two very important and interwoven functions in the animal. The obvious function of cushioning/shock absorbing are readily apparent. Equally vital to the health of the horse is the role the hoof plays in the cardiovascular system, where hoof compression serves to force the blood back to the heart. A review of the parts of the hoof will explain how these two functions work together.

The shape of the hindfoot is slightly different from that of the forefoot. The toe of the hindfoot is more pointed, and the sole is more concave.

HOOF WALL AND LAMINAE The bulk of the hoof wall is composed of keratinized epithelial cells, which are arranged in tubules that run from the coronary band to the ground surface. The tubules on the outer surface help retain moisture and contain pigment. The same cells close to the white line do not contain pigment.

The insensitive laminar layer forms the inner surface of the hoof wall. This layer intermeshes with the sensitive laminae that cover the surface of the coffin bone. The white line of the foot is the area where the laminae intermesh. It is composed of sensitive and insensitive laminae. This combination of structure gives it a yellowish color. It should not be confused with the white area of the hoof wall tubules adjacent to the white line.

The hoof wall is thickest at the toe and becomes thin at the quarters. The quarters are located on the sides of the hoof about half way back between the toe and the heels. At the angle of the wall, the wall is reflected forward to form the bars of the foot. The bars serve to prevent overexpansion of the hoof wall. The hoof wall is the weight-bearing surface of the hoof.

SOLE The sensitive sole covers the bottom of the coffin bone. The sole has a self-limiting growth as flakes of it slough off after it gets about as thick as the hoof wall. The sole is concave at the ground surface. This shape, in conjunction with the continual scaling or sloughing, prevents the sole from bearing weight. The sole is easily bruised, and bruises occur frequently when the sole bears weight.

FROG The frog is the elastic, wedge-shaped mass that occupies the area between the bars. The point of the frog toward the toe is referred to as the apex. The horny frog is produced by papillae that project from the surface of the sensitive frog. Elasticity is enhanced by greasy secretions from the fat glands that pass from the digital cushion into the frog. The moisture content is about 50%, which also helps to maintain a pliable condition.

DIGITAL CUSHION The back half of the hoof contains the digital or plantar cushion. This fibroelastic, fatty cushion acts as a shock absorber for the foot.

BONES Three bones are located in the horse's hoof: the short pastern, the coffin bone, and the navicular bone. The coffin bone is located mainly to the front of the hoof and slightly to the outer side of the hoof. It is the largest bone in the hoof, is quite porous, and resembles a miniature hoof in shape. The short pastern is partly in the hoof and partly above it. The navicular bone is the smallest bone of the hoof and increases the articular surface and movement of the coffin bone.

CONCUSSION ABSORBING The structures in the hoof work together to absorb concussion when the foot strikes the ground. As the hoof strikes the ground, the heels are expanded by the frog action. The frog is pushed up and flattens. The frog forces the digital cushion upward and outward on both sides of the hoof. The compression of blood veins forces blood out of the hoof and the remaining pooled blood acts as a hydraulic cushion that absorbs concussion. To aid further in concussion absorption, the coffin bone descends slightly and the sole yields slightly. As the weight is transferred from the short pastern to the navicular bone, the navicular bone yields slightly before the weight is transferred to the coffin bone. The remainder of the concussion is absorbed at the pastern, knee, and shoulder.

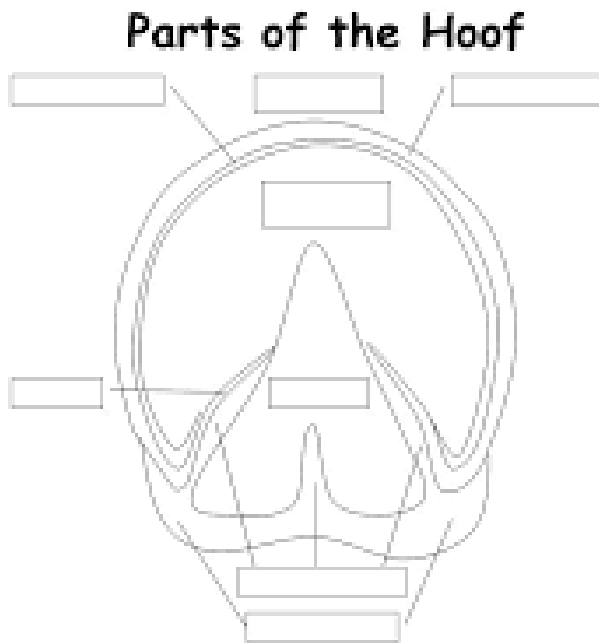
BLOOD PUMPING MECHANISM OF THE HOOF

Blood is necessary for growth, normal functioning, and repair of injury or worn-out tissue. Blood is pumped by the heart through arteries to the foot and is assisted in its return to the heart by a "pumping mechanism" in the hoof. The mechanism must be present due to the position of the hoof in relation to the heart. There are no muscles located in the lower part of the leg or hoof, as we find in other parts of the body, to aid in returning venous blood to the heart.

Located on both sides of the lateral cartilages and the sensitive structures of the foot are large venous plexuses. Each plexus is made up of an extensive network of veins. The compression of these veins by the plantar cushion against the lateral cartilages or the coffin bone against the hoof as the hoof strikes the ground acts as a "pump" to force the blood up the leg and back to the heart.

Blood is prevented from returning to the foot by valves in the veins of the leg. Compression of the plexuses also acts as a valve to contain blood in the vessels of the foot below the plexuses. This produces a "hydraulic cushion" that further dissipates concussion and protects the fragile coffin bone.

The valve action also creates a fluid pressure which causes the blood to exit up the leg and the plexuses to fill when the foot is raised and the compressed veins open. Each time the foot bears weight, the veins are compressed. Each time the foot is raised, the veins open and blood is pushed in by the arterial pulse and gravity



Label the parts of the Hoof

6. Identify the three bones in the horse's hoof:

a. Largest bone, quite porous, located mainly to the front and slightly to the outer side:

b. Located partly in the hoof and partly above it:

c. Smallest hoof bone, increases articular surface and movement:

1. _____ compression forces blood back to the heart.

2. Most of the hoof wall is made up of keratinized _____ cells.

3. The _____ covers the bottom of the coffin bone and is easily bruised when it bears _____.

4. The _____ is the elastic, wedge-shaped mass between the bars.

5. The back half of the hoof contains the _____ or plantar cushion that acts as a _____ absorber for the foot.

What equipment and techniques are required for proper grooming of a horse?

Grooming is an essential part of caring for a horse. Daily grooming is the only way to remove dust, dirt, grease, scurf and dead cells from the horse's skin. Grooming stimulates blood circulation and brings out the natural oils in the skin to give it a glossy sheen.

BASIC GROOMING The basic equipment used in grooming a horse consists of a hoof pick, rubber curry comb, stiff bristle brush, soft body brush, mane and tail comb and grooming cloth.

Grooming the feet: Start grooming with the feet. Properly pick up the horse's foot and clean it with a hoof pick. Remove dirt, manure, and other foreign material from the sole, frog and crevices of the frog. It is important to clean the horse's foot from the heel to the toe. If you pull the hoof pick the other direction, from the toe to the heel, you could lodge dirt and debris in the crevices of the frog. Also, cleaning the hoof in the wrong direction may cause you to drive the point of the hoof pick into the sole of the foot if the horse pulls his foot away.

Curry comb: Next, use the curry comb to remove mud and loosen matted hair, dirt and scurf. Use the brush in a circular motion, beginning on the neck and working toward the back of the horse. If you use the curry comb on the head or below the knees and hocks, do so with caution. It is uncomfortable for the horse when it is used over bony areas.

Stiff bristle brush: The stiff bristle brush is used to remove deep-seated dirt and scurf. Use with short, deep strokes in the direction the hair lies. At the end of each stroke flip the brush up so dirt and scurf is lifted away from the horse. Use this brush on the head and lower leg to remove dirt.

Soft body brush: After using the stiff bristle brush, use the soft brush to remove surface dirt and dust. This brush can be used all over the horse brushing in the direction the hair lies. Flip the brush up to remove dirt at the end of each stroke.

Grooming cloth: The final piece of equipment used in grooming is the grooming cloth. Rub the horse with the cloth making sure you go in the direction the hair lies. This cloth can be used all over the horse. It will help spread the natural hair oil over the horse's body. Clean eyes, nose and ears with damp sponges. A separate sponge should be used to clean the dock.

Grooming the mane: The mane should be brushed out using a mane comb or brush. Make sure to work tangles out without breaking mane hairs. To shorten the mane, pull out the long hairs; never use scissors to cut the mane. Never use a comb on the tail, because this will pull out tail hairs and shorten the tail. The tail hairs should be separated by hand with your fingers and then brushed.

BATHS Periodically, you may have to give a horse a bath. Before giving a bath, be sure that the horse will have enough time to dry before nightfall. The temperature should be at least 50 F or the horse may get chilled, which could lead to a cold.

Use a gentle soap or hair shampoo. Start by getting the horse wet. Start washing behind the ears and move toward the hindquarters. Make sure you wash under the tail. Use a rag or sponge to wash the face. When rinsing the horse make sure that you do not get water in the ears. Make sure that you thoroughly rinse all the soap off the horse. Remove excess water from the coat with a sweat scraper to help dry the horse. After the horse dries, brush and rub with a cloth to bring the natural oil up to the coat.

Clean the penis sheath of stallions and geldings periodically to remove dirt, grease, and debris. The sheath should be cleaned at least once a year. Wash the penis and inside of the sheath with a warm, antiseptic soap solution. Make sure you thoroughly rinse the sheath to remove all the soap and debris. Failure to adequately remove the soap may result in a skin irritation.

MANES

A bridle path is normally about six to eight inches long starting from the poll but may be only 1-1/2 to 2 inches. For manes that are shorter rather than full and long, pull the mane rather than cutting it. To shorten and thin the mane, comb the hair with a mane comb. Grasp the end of the long hairs with one hand and back comb the remainder of the hairs. Pull the long hairs out. Continue until the mane is thin and at the proper length.

BLANKETS

In winter, blankets keep the horse warm so that it does not grow a heavy coat of hair. Blankets help keep the hair clean. A cooling or summer sheet is placed on some horses such as racehorses while they are being cooled out after exercise, to prevent them from cooling out too fast.

<i>Basic tools and techniques</i>			
TOOL	FOR	HOW TO USE	DESIGN
Rubber curry comb 	Loosens dirt and dandruff while providing a massage.	Circular pattern with varying degrees of pressure. Tap on boot frequently to clean.	Use fine density for face and legs; thicker teeth for body.
Body brush 	Lifts out debris loosened by the curry and distributes the natural coat oil.	Short, flicking motions. Frequently rub across curry comb to clean.	Medium stiffness is adequate and comfortable for most horses.
Finishing brush 	Removes any remaining dust and evenly distributes natural skin oil for shine.	Smooth, short flicks along the body.	Often available in horse hair fibers.
Mane and tail brush 	Gently brushes mane and tail without damage.	Start at the bottom and gently brush small lengths. Do not force tangles as it will break the hair.	Various designs including pin cushion types and human hair brushes.
Shedding blade 	Serrated blade removes loose, shedding hair in the spring or thick caked mud; smooth side is for scraping sweat or water.	Long, sweeping motions.	Universal basic design
Hoof pick 	Removes dirt, rock and manure from hoof.	Remove packed dirt and clean the spaces along the frog.	Various designs and sizes.

Body Condition Score

How can I use body condition scoring as a tool to appraise and classify horses based on relative indicators of body fat?

In a world where millions of people are taking steps to improve their own physical condition in order to live healthier lives, it only stands to reason that this same concept would be applied to other aspects of their lives and businesses. The ability to accurately assess a horse's body condition, which is vital to its welfare, weighs heavily on the industry.

The old saying "Beauty is in the eye of the beholder" has never been more appropriate than in the body condition of horses. Beauty in one owner's eye is fat in another's. Hence the problem: What is the appropriate body condition score of a horse, and what would be acceptable to the industry? A body condition scoring (BCS) system developed by Dr. Don Henneke has served to provide a standard scoring system for the industry which can be used across breeds and by all horse people. The system assigns a score to a particular body condition (1 to 9) as opposed to vague words such as "good," "fair," "bad," or "poor," which leave differences in interpretation to the eye of the beholder.

The horse's body condition measures the balance between intake and expenditure of energy. Body condition can be affected by a variety of factors such as: food availability, reproductive activities, weather, performance or work activities, parasites, dental problems, and feeding practices. The actual body condition of a horse can also affect its reproductive capability, performance ability, work function, health status, and endocrine status. Therefore, it is important to achieve and maintain proper body condition. In order to do this, body fat must be evaluated in relationship to body musculature.

BODY CONDITION SCORING SYSTEM The system developed by Dr. Henneke assigns a numerical value to fat deposits that occur in various places on the horse's body. The system works by assessing fat both visually and by palpation in each of six areas. Horses accumulate fat in these areas in a set order. For instance, a horse that scores 7 will have the same amount of fat as any other horse that scores 7, whether he is a Thoroughbred, Quarter Horse or Arabian.

Fat is assessed in the following areas: the loin, ribs, tailhead, withers, neck and shoulders. A numerical value is assigned based on the cumulative fat in all six areas.

Loin: An extremely thin horse will have a negative crease and ridge down the back where the spinous processes project up. No fat can be felt along the back of the horse. However, this is one of the first areas to fill in as a horse gains weight. Fat is first laid down around the body organs, then along the spinous processes. As the horse gets fatter, an obvious crease or depression forms down the back because of fat accumulation along the spinous processes.

Ribs: The next place to look is in the ribs. Visually assess the rib area, then run your fingers across the middle of the rib cage on each side. A very thin horse will have prominent ribs, easily seen and felt, with no fat padding. As the horse begins to gain weight, a little padding can be felt around the ribs; by a BCS of 5 the ribs will no longer be visible, but can be easily palpated by passing a hand down the rib cage. Once the horse progresses toward obesity, feeling ribs will be impossible.

Tailhead:

In a very thin horse up to a BCS of 3, the tailhead is prominent and easily discernible. Once the horse starts gaining weight, fat fills in around the tailhead. Fat can easily be palpated, and as the horse becomes obese, the fat will feel soft and begin to bulge.

Withers:

Conformation of the withers may affect your assessment of body condition. The prominence or sharpness of the withers may vary between breeds; a Thoroughbred typically has more prominent withers than a Quarter Horse. However, if a horse is very thin, the underlying structure of the withers will be easily visible. At a BCS of 5, the withers will appear rounded. At a BCS of 6 through 8, varying degrees of fat deposits can be felt along the withers. In obese horses, the withers will be bulging with fat.

Neck: The neck allows for refining the assessment of body condition. In an extremely thin horse, you will be able to see the bone structure of the neck, and the throat latch will be very trim. As the horse gains condition, fat will be deposited down the top of the neck. A body condition score of 8 is characterized by a neck that is thick all around with fat evident at the crest and the throat latch.

Shoulder: The shoulder will also help you refine the condition score, especially if conformation factors have made some other criteria less helpful. As a horse gains weight, fat is deposited around the shoulder to help it blend smoothly with the body. At increasing condition scores, fat is deposited behind the shoulder, especially in the region behind the elbow.

PUTTING THE SYSTEM TO WORK Once body condition scores have been determined for your horses, how can you tell what is too fat or too thin? It has been suggested that the optimum score is a 5. This horse has some body fat but has not yet reached the fleshy point. A horse below a BCS of 5 may have fat stores too low to maintain a healthy status if stressed. Body fat reserves are important to the overall health of a horse because fat represents energy reserves that can be used during periods of stress. Horses at a BCS of 3 or below have virtually no fat reserves; if more energy is needed, protein is broken down from muscle to meet energy requirements.

If a horse is exposed to extreme cold, lactation, or some other severe stress, a BCS of 6 or 7 would be desired. A horse can easily burn a great deal of fat in a short period of time in a high stress situation. Body fat also plays a role in reproduction. Mares with a BCS of 3 or below develop endocrine imbalances and have difficulty conceiving.

Horses with high condition scores are also predisposed to problems, but the problems are less immediate than those of a horse in poor condition. Fat horses tend to be less agile performers and tire more quickly than trimmer horses. Fat horses are also more prone to colic and laminitis. Extremely fat horses may also have endocrine problems; they may be hypothyroid and show a deficient metabolic rate, which most likely is one reason they are fat.

One more factor you should consider when assigning a body condition score is the basic body type of your horse. Some horses, usually the easy keepers, just tend to carry more body fat than others. A horse that always seems to score a 7 or 8 despite attempts to lower the horse's weight, may be perfectly healthy at that score. Additionally, the horse may require more exercise to keep muscles in shape.

This body condition scoring system will by no means tell you how fit your horse is for performance. Generally, though, horses in training will have less fat due to their exercise intensity. Fat level has nothing to do with muscle tone, cardiovascular fitness, or any other measure of athletic conditioning. The scoring system also does not distinguish between types of fat deposited.

1. A _____ (BCS) system developed by Dr. Don Henneke provides a standard scoring system for all horse breeds.

2. When evaluating proper body condition, body _____ is evaluated in relationship to body _____.

3. The _____ is one of the first areas to fill in as a horse gains weight.

4. A BCS of 6 or 7 would be desired if a horse is exposed to extreme _____, _____ or some other severe stress.

5. Mares with a BCS of _____ or below may have difficulty conceiving.

6. Fat horses may be less agile, _____ more quickly and be more prone to _____ and _____ than trimmer horses.

Characteristics of Individual Condition Scores:

Condition	Neck	Withers	Loin	Tailhead	Ribs	Shoulder
1 Poor	Bones easily seen	Bones easily seen	Spinous process visible	Spinous process visible	Easily seen	Bones easily seen
2 very thin	Faintly visible	Faintly visible	Slight fat cover	Prominent	Slight fat cover	Shoulder visible
3 Thin	visible	visible	Spinous process easily visible	Prominent but vertebrae not visible	Slight fat cover easily visible	Shoulder visible
4 Moderately Thin	Not thin	Not thin	Negative crease along back	Fat can be felt	Faint outline	Shoulder not obviously thin
5 Moderate	Blends smoothly into body	Wither rounded	Back level	Fat feels spongy	Cannot be seen, but can easily be felt	Shoulder blends smoothly into body
6 Moderately Fleshy	Fat being laid down	Fat being laid down	Slight positive crease down back	Fat feels soft	Fat feels spongy	Fat beginning to be deposited
7 Fleshy	Fat laid down along neck	Fat along withers	May have slight positive crease down back	Fat is soft	Can be seen, but filling between ribs with fat	Fat behind shoulder
8 Fat	Neck thickens	Fat along withers filled	Positive crease down back	Fat is very soft	Difficult to feel ribs	Area behind shoulder flush with body
9 Extremely Fat	Bulging fat	Bulging fat	Obvious positive crease down back	Building fat	Patchy fat over ribs	Bulging fat



Preventing Farm Fires

What can be done to prevent or extinguish a fire? Each year fires result in millions of dollars of damage to homes and farms, and the deaths of hundreds of people. The best protection against fire is prevention. Part of prevention is to understand the elements that make up a fire. Three elements, commonly referred to as the fire triangle, that must be present are: fuel, heat or ignition source, and oxygen. Subtracting any one of these from a situation will eliminate any chance of fire.

The easiest element to remove from the fire triangle is the fuel. One way to do this is through good housekeeping. Be sure that all combustible garbage and scraps are picked up and properly disposed of. Do the same around buildings, clearing the area of weeds and brush.

In many cases firebreaks provide the best type of protection. Always be sure that oily rags are placed in metal containers with a lid to prevent spontaneous combustion. To eliminate the heat or ignition factor, do not allow smoking by anyone in the area, and

be sure that hot equipment is allowed to cool before leaving an area.

If a fire does start, be prepared to evaluate the situation and take action. If the fire can be easily contained, use a fire extinguisher. However, be sure to identify the type of fire and correct extinguisher to use.

THREE CLASSES OF FIRES

- The first type of fire is classified as ordinary combustibles and is extinguished with a Class A fire extinguisher. Ordinary combustibles include items like wood, paper and hay and are put out with water extinguishers. Water removes the heat and oxygen as well as neutralizing the fuel.
- The second type of fire is caused by flammable liquids such as gasoline, diesel fuel, grease and solvents. The Class B fire is eliminated with a carbon dioxide extinguisher, which will block the oxygen from the fire triangle. Water should never be used on a Class B fire because it will serve only to spread the flames on the fuel. If water is the only extinguishing element present, it can be used to keep surrounding buildings wet and prevent the fire from spreading further.
- The third type of fire is an electrical fire, called a Class C fire. These fires are extinguished with carbon dioxide or dry chemical extinguishers. Again, water should never be used on this type of fire because water will conduct electricity and could result in the electrocution of the firefighter.
(REMINDER: water can be used only on Class A fires, carbon dioxide extinguishers can be used on Class A, B and C fires.)

USING EXTINGUISHERS

After determining the type of fire and selecting the correct extinguisher, the fire can be put out. To use an extinguisher correctly, hold it upright, stand back three to five feet, pull the safety pin, aim at the base of the flames, squeeze the trigger firmly and apply the extinguishing element in a back and forth motion.

No extinguisher will help you if it is not in correct working order. Regularly check each extinguisher for the following items:

1. Is the nozzle clear of any obstructions?
 2. Is the hose free of cracks?
 3. Is the safety ring in place?
 4. Is the extinguisher fully charged?
 5. Is the extinguisher free of any dents?
- If a defect is found after doing an inspection, contact your local fire department.

When a fire is too large to be put out with an extinguisher, call the nearest fire department immediately and be sure that no one is trapped by the flames. When calling the fire department, remember the following key points:

1. Stay calm! If the people handling the call are unable to understand you or are unable to get the necessary information from you, they will be delayed in helping you.
2. Know your exact location. Be able to provide the fire department with the correct address and/or fire number. Too often help is delayed because of an incorrect address.
3. Know the source and size of the fire, and if anyone is trapped inside. The more information that the fire department has, the more effective they can be in helping you.

REDUCE YOUR RISKS

No home or business should be without smoke alarms on each floor. A good rule of thumb is to change the batteries each spring and fall with the changing of the clocks.

Fires have the potential to be dangerous, even life-threatening. By following some easy prevention techniques you may substantially cut your risks of having a fire. Understanding what to do in case of a fire and staying calm can literally mean the difference between life and death.

Answer the following questions:

1. The three elements of the fire triangle are _____ , _____ or ignition source, and _____ .
2. The best way to remove fuel from the fire triangle is through good _____ .
3. Oily rags should be placed in a _____ container with a lid to prevent _____ combustion.
4. Class A fire extinguishers are for ordinary _____ and use _____ to put out the fire.
5. Class B fire extinguishers put out fires caused by _____ liquids and use _____ to put out the fires.
6. Type C extinguishers are used for _____ fires and use _____ or _____ chemicals to put out the fires.
7. When calling the fire department, you should stay _____ , know your exact _____ , know the _____ and size of the fire and report if anyone is trapped inside.
8. A _____ should be located on each floor of a home or business.

Evolution of the Horse

Evolution of the horse did not occur in a straight line toward a goal, like a ladder. Rather, it was like a branching bush, with no predetermined goal. Many horse-like animals branched off the evolutionary tree and evolved along various unrelated routes, with differing numbers of toes and adaptation to different diets. Now one genus-*Equus*-is the only surviving branch of a once mightily and sprawling evolutionary bush. The horse's role has been everything from a source of food to a source of power. In our society, the horse has had a major influence and has played a major role in the development of the United States.

Scientific Classification

Kingdom: Animalia

Phylum: Chordata

Class: Mamalia

Order: Perissodactyla

Family: Equidae

Genus: *Equus*

Eohippus is the earliest forerunner of our present day horse. Small primitive horse about the size of a fox. It had an elongated skull, a moderately arched back and a shortened tail. Four functional toes on each front foot, but only three toes on each hind foot. Teeth structure suggests that it was a browser.

Mesohippus About 35 million years ago, Earth's temperature and climate changed; conifers began to outnumber deciduous trees. The forest thinned, grass became more prevalent and Mesohippus appeared.

This animal was larger than Eohippus. Its teeth had further evolved. It only had three toes on its front and could better outrun enemies. On Mesohippus, the lateral supporting toes decreased in size while the middle toe strengthened. These horses became extinct about 7 million years later.

Merychippus This horse evolved in North America and adapted to the hard grasses of the plains. This was the beginning of the grazing horse of today. It lived in herds and a single hoof emerged.

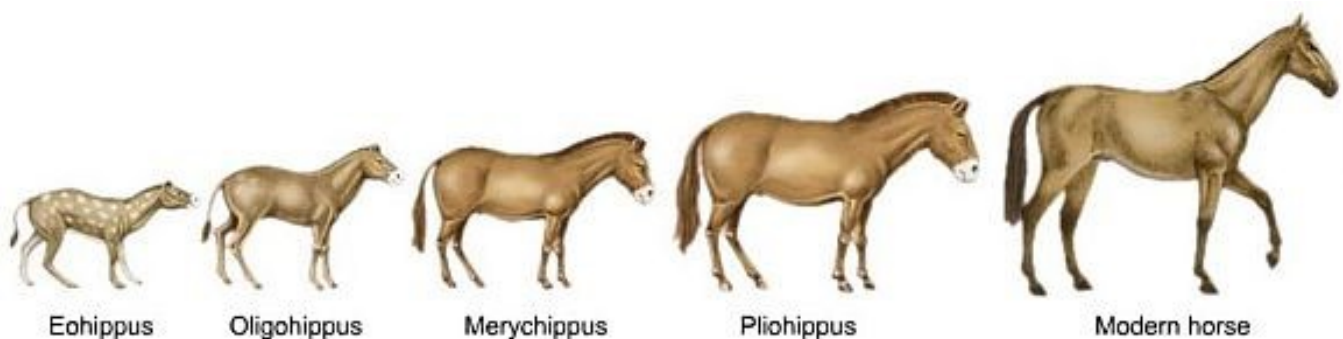
Pliohippus About five million years ago, one branch of horses crossed into Asia, quickly multiplied, and spread to Europe. Meanwhile in North America, the horse developed into the model. Pliohippus was the first true monodactyl (one-toed animal) of evolutionary history. This horse spread into South America, Asia, Europe and Africa.

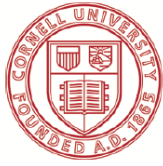
The last two million years, from the present the Plesistocene epoch, represent the final evolutionary stage of *Equus*. About 8000 years ago, *Equus* became extinct in the Western Hemisphere.

Horses didn't return until the Spanish brought horses to the New World in the 1400s.

Horses first appeared in North America some 50 million years ago, then spread to Europe and Asia.

The first horse was Eohippus, which means "dawn horse". The delicate little dawn horse was about the size of the small dog. He had four toes on the front feet and three toes on the back feet. He had slender legs, a short neck, and teeth suitable for chewing leaves. Eohippus depended on leaping and running to escape from his enemies.





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f. 716-699-5701

cattaraugus.cce.cornell.edu

4-H Youth Horse Program

COMMITMENT TO EXCELLENCE

- I believe that participation in the 4-H Horse Program should demonstrate my own knowledge, ability and skill as a caretaker and exhibitor of equines.
- I will do my own work to my fullest extent that I am safely capable and will accept advice and support from others.
- I will not use abusive, illegal, fraudulent, deceptive or questionable practices in the feeding, fitting and showing of my animal(s), nor will I allow my parents or any other individuals to employ such practices with my animal(s).
- I will read, understand and follow the rules put forth by the Cattaraugus County 4-H Horse Program, without exception, for all horse shows in which I am a participant, and I will ask that my parents and supervisors of my project do the same.
- I wish for my horse project to be an example of how to accept what life has to offer, both good and bad, and how to live with the outcome.
- I realize that I am responsible for:
 1. The grooming, and care of my project animal(s),
 2. The proper care and safe, humane treatment of my animal(s),
 3. The safe handling of my animal(s) at all times,
 4. Demonstrating strong moral character as an example to others.
 5. Supporting and respecting all the youth and volunteers at any and all 4-H events

4-H Youth's Signature

Date

Parent/Guardian Signature

Date

4-H Educator's Signature

Date

NYS 4-H HORSE CERTIFICATE

____ Personally owned

____ Family owned

____ Non-owned
(See non-ownership policy/reverse side)

Date _____ 20____



Name of Animal _____

Date Animal Born (Mo.) _____ (Day) _____ (Yr.) _____ Sex M ☐ G ☐

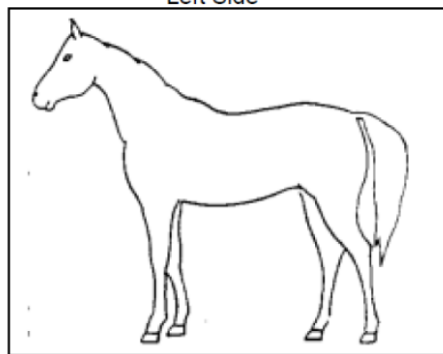
Name of Sire _____

Name of Dam _____

Registry/Breed _____ Reg. No. _____

Date of Purchase _____ Member County _____

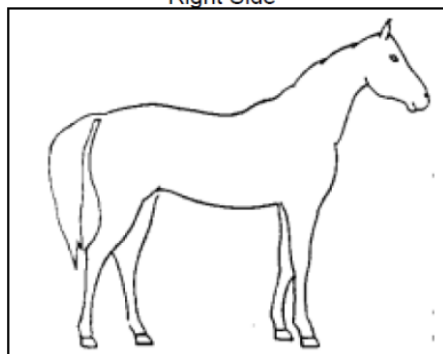
Left Side



Draw markings on each side and face identical to your horse



Right Side



Color _____

Owner _____

Height _____

Address _____

Weight _____

(Zip) _____

Signature of Owner _____

This animal has been officially designated as the 4-H project animal of the 4H'er as of June 1 of the current project year.

Name of 4-H'er _____

4-H Leader Name _____

Address _____

Address _____

_____ Zip _____

_____ Zip _____

Telephone _____ Email _____

Telephone _____ Email _____

Member's Signature _____

Leader's Signature _____

Parent/Guardian _____

Educator _____ County _____

Address _____

Address _____

_____ Zip _____

_____ Zip _____

Telephone _____ Email _____

Telephone _____ Email _____

Parent/Guardian Signature _____

OCE Educator Signature _____

Remember to include a copy of your current Coggin's test - test dated this year or last year. *Proof of rabies vaccination required - must be current, given more than 14 days prior to arrival at fairgrounds, and remain current for duration of the Fair.

See reverse side for important information