

Feed

Feeding Your Horse

Every horse owner takes pride in the appearance, well being and health of their horse. The first step is to make sure that the horse is properly fed. Your horse relies on you to feed it. You should watch your horse's attitude, eating habits, weight and condition carefully to ensure that you are providing the nutrition that your horse needs, in a consistent manner.

Here are ten basic rules of good feeding:

1. **If possible, feed smaller amounts more often.** A horse grazes (eats grass) a little at a time throughout the day and night. This is because the horse has a small stomach for its size. Therefore, it needs a little food in the stomach at all times to allow proper digestion. The number of times you feed your horse will depend on the type and amount of feed he requires to do the work expected of him. Horses should never be fed more than four pounds of concentrate (grain) per feeding.
2. **Feed plenty of bulk food.** Hay is the main source of food for a stabled horse. It ensures, as with grazing, that the digestive tract functions properly. Successful digestion cannot take place without adequate bulk. Forage is the basis of all horse diets. Forage can be provided as hay, pasture, or high fibre feed. When feeding straight forage, allow approximately 2 – 2 ½% of body weight per day. When concentrated feeds are included in the diet, make sure they get at least 1% of their body weight of forage per day.
3. **Feed according to work done.** This is especially important for concentrated foods (grains). Increase the amount of feed if work is increased, reduce it if the horse is doing less work. Grain is used to increase the energy in the diet if hay will not meet the needs or if the activity requires less bulk in the diet.
4. **Make no sudden changes.** Changes in the type of food or the feeding routine must be gradual. Alter it gradually over a 7 - 10 day period. This includes putting horses out on pasture in the spring. Do it gradually so their digestive system will adjust.

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5. Keep the same approximate feeding times. Horses are creatures of habit and a slipshod feeding schedule can affect their disposition. On the other hand, if too much routine is causing your horse to become impatient and demanding, you may need to vary feeding times.
6. Feed only clean and good quality hay. Mouldy, musty or dusty hay can have a bad effect on the health and well being of your horse. Feed only mould free hay and grains, and make every effort to minimize dust. Lightly watering the feed will help reduce dust in some hay. Keep feed tubs, water buckets and mangers clean. Saliva, feed particles and warmth provide an excellent environment for bacterial growth.
7. Provide free choice access to salt.
8. Do not work your horse hard immediately after a full feed. When the stomach is full, it affects the working of the heart. How long between the feeding time for your horse and his work depends upon how hard he will be working and what you are asking him to do. For example a race or roping horse should finish eating four hours before the competition. However, an endurance horse would eat hay right up to the competition to help store water. In general, allow at least 1 hour after feeding before working a horse and do not feed afterward until he is cool.
9. Provide free choice water at all times and in all seasons. An adult horse will consume an average of 10 - 14 gallons daily; hot weather, hard work and lactation can nearly double this amount. If water is not available at all times, horses should be watered three times per day before feedings. Eating snow is not sufficient to satisfy horses water requirements. Horses will drink more from a waterer in the winter than from an ice cold dugout or creek.
10. Feeding the Senior Horse – Start feeding the elderly horse a highly digestible ration *before* he starts declining in health. Once an older horse has lost condition, putting weight back on him is often difficult. A horse's ability to digest feed, especially protein, fibre and phosphorous declines as he reaches and exceeds 20 years of age. Feed a ration that is at least 12 – 14% protein. An ideal ration would be good quality grass/alfalfa hay, a vitamin supplement and free choice clean water and salt. Many feed companies make a complete ration designed for the older horse.



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Where to Feed

Feeding in a feeder or pail will help to prevent waste and mess, thus reducing the hay requirements and feed costs. This is also preferred because it will help prevent your horses from reinfecting themselves with parasites as quickly as if they were fed on the ground. Make sure the aggressive horse(s) are not keeping the others away from the feed. If this is happening, it may be necessary to feed in 2 or more places.

Introduce lush grass slowly to your horse. Let their feces be your guide. If diarrhea occurs feed hay until normal manure re-occurs. Managing pastures used by horses is important. Deep hoofprints will tend to kill the roots of seedlings as well as disfigure the terrain. As pasture grasses mature, their nutritional value will decrease and may need to be supplemented with hay and mineral blocks.

Horse Nutrition

Feed can be divided into five main types of essential nutrients. Each type has a different job in the horse's body. The five types are:

-  energy nutrients (carbohydrates and fats)
-  proteins
-  vitamins
-  minerals
-  water

If one of these is provided in a limited amount, it will be responsible for limiting the functions of the others even though the others are provided in adequate amounts. Energy is sometimes referred to as Total Digestible Nutrients (TDN). Some nutrition references will measure energy in calories or megacalories.

Energy

Energy can be defined as the calories needed to enable the horse to do the work required of him. This "work" can range from standing in a stall to regular riding. Other types of work may be growth, a mare creating a foal during gestation and the work that is necessary for the mare to produce milk during lactation.

The level of energy that is required for the horse will change depending on the types and the amount of activity that the horse is involved in, the conditions in which it is living (such as temperature) and the stage of development (age) it is at.

Proteins (Hay)

Proteins are highly complex. During digestion, proteins are broken down into amino acids. These are absorbed from the intestine into the blood stream and carried to all parts of the body. They are recombined to form body tissue and eventually become muscle, internal organs, bone, blood, skin, hair, hooves and many other parts of the body.

Minerals

The mineral content in feed can be determined by chemical analysis. Because the quality and type of hay available to horses changes throughout the year, make sure your horse always has an available supply of horse mineral supplements and salt on a free choice basis. The main concerns are calcium, phosphorus and salt. Cattle minerals and salts are not always suitable for horses.

Vitamins

Horses only need vitamins in small amounts. They are essential to the normal body functions and the lack of these may cause diseases. The vitamins are A, C, D, E and the B complex. Most of the vitamins will be received in adequate amounts if the horse is provided the proper amount of quality feed. The vitamin which is often lacking in the horse's diet is Vitamin A. Vitamin A is made by the horse's body from carotene in green pasture and green leafy alfalfa hay.

Sunshine and sun-cured hay are good sources of vitamin D. Vitamin D is manufactured in the skin by exposure to ultraviolet radiation. Several hours outdoors in the sunlight should enable a horse to accumulate adequate supplies.

Water

Horses need a reliable supply of fresh, clean water for their bodies to function properly. Lactating mares need an increased volume.



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The Function of Nutrients

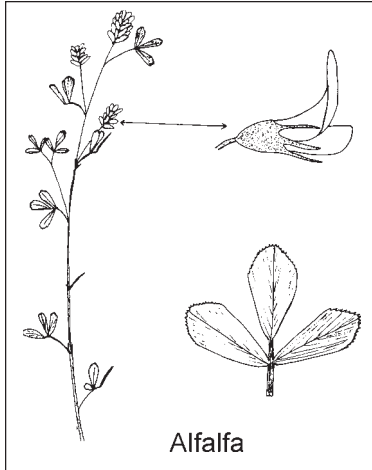
Mineral Required by Horses for the Maintenance of Good Health		
Name	Source	Function
Calcium & Phosphorous (especially important in growing horses)	hay, oats and mineral supplements	<ul style="list-style-type: none"> ➤ metabolism ➤ development of bones
Copper & Iron	hay, oats and mineral supplements	<ul style="list-style-type: none"> ➤ oxygenation of circulatory system ➤ also required by digestive system
Iodine	iodized (red) salt	<ul style="list-style-type: none"> ➤ metabolism
Sulphur, Manganese, Magnesium & Potassium	hay and oats, mineral supplements	<ul style="list-style-type: none"> ➤ metabolism

Vitamins Required by Horses for the Maintenance of Good Health		
Name	Source	Function
Vitamin A	Converted by the body from the carotene in green forage. Also found in vitamin supplements.	<ul style="list-style-type: none"> ➤ necessary for reproductive, digestive and respiration systems and for metabolism and growth.
Vitamin B Complex	Green, leafy grass or hay.	<ul style="list-style-type: none"> ➤ metabolism
Vitamin D	Sunlight and vitamin supplements Sun-cured hay.	<ul style="list-style-type: none"> ➤ assists in the assimilation of nutrient calcium and phosphorous for the production of sound bones and teeth.

Judging the Quality of Hay Products

Palatable

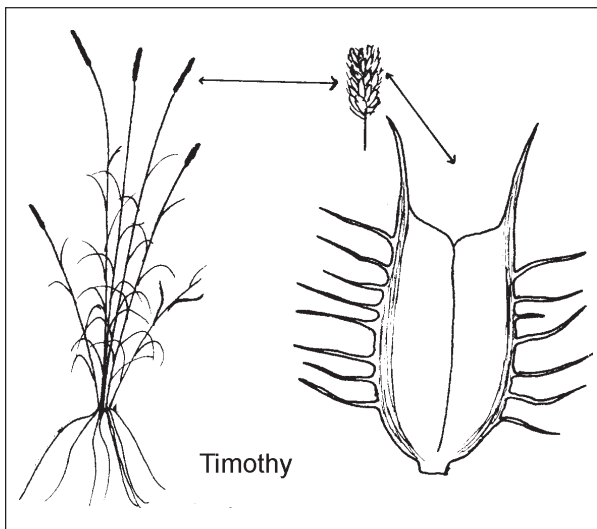
Palatable is a term used to describe feed that is agreeable to the taste of horses. Some feeds are not appetizing to some horses, while they are to others (for example, not all horses like carrots). Some foods are not palatable to any horses because of their taste and/or texture. Make sure the feeds you are offering are palatable to your horse. If he won't eat it, it's not nutrition!



Cleanliness

Hay should not be dusty or mouldy (musty). Smelling the hay can help one to detect this properly.

Hay can be broken into two categories; legumes (alfalfa, clover, trefoil and sainfoin) and grasses (orchard, brome, fescue, and timothy). Hay used in Canada is often grown in mixtures consisting of varying proportions of legumes and grasses. The three most common types of hay for horses in Alberta are Alfalfa, Timothy and Brome grasses. Other types include Crested Wheat, Fescues, Rye Grasses and Orchard Grasses.

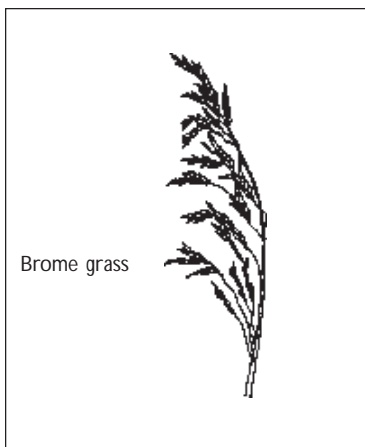


Leaf, Stem Ratio

There should be a greater ratio of leaves to stems. Leaves provide the majority of nutrients so it is important that hay contains a high ratio of leaves.

Purity

It should contain minimal foreign plants such as weeds and other undesirable grasses.



Colour

Hay should be a clean green colour, not brown or black. Green colour signifies that the hay was harvested at the correct growth stage, moisture content and that it was properly stored. It also is an indication that it was able to cure without rainfall which can reduce the quality of nutrients.



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Energy Foods

The grazing horse meets all its energy requirements by eating grass. However, when a horse is kept in a stable and/or put to work, it needs concentrated food in the form of hay and grain to meet its energy requirements. In Canada the conventional grain for horses is oats. Corn, barley, bran, beet pulp and linseed are sometimes used to supplement the diet.

Feeding too much carbohydrate can cause a horse to get fat or too excitable.

Unless you are going to have your grain mix pelleted, do not grind your horse feed. It is an unnecessary expense. Ideally, corn should be cracked and oats crimped but no more. Ground feeds become dusty, unpalatable and may cause digestive disturbances for your horse. There is no advantage to having grain crushed or rolled.

Oats

Oats can be consumed and digested in larger amounts than any other grain without special preparation and without upset to the digestive system. It is the preferred grain for horses.

In Canada, oats are graded according to: weight per bushel, the variety, the standard of quality, and the content of wildoats and other grains and seeds. These standards are, in order of descending feed values: 1, 2 and 3 Canadian Western and 1, 2 and 3 Feed.

Choosing the grade to use requires consideration of feed value and costs. The recommended grades for horse owners is Number 3 Canadian Western or Number 1 Feed.

Corn

Corn is lower in protein and minerals than other feed grains but energy content is higher. Corn may be fed shelled or cracked.

Barley

Barley is not used widely for feeding horses because it is "*too hot of a feed.*" It has a higher energy content so greater care must be taken to ensure the proper ration is given.



Beet Pulp

Beet pulp is an excellent source of digestible fiber, protein (8 – 12%) and energy. Therefore it is useful for all horses, especially older horses and “*hard keepers*”. It also provides calcium. It is usually fed at about two to five pounds per day, but introduce it slowly. Also, provide adequate water as it is in the form of pellets that need to be rehydrated.

Bran

Bran is the outer layer of the wheat germ and is a by-product of flour milling. It is used to add bulk to grain rations and to influence the horse to chew more thoroughly. It is also a source of thiamine (Vitamin B). In its dry form, one or two handfuls may be added to each feed. As a mash it is mixed with boiling water to produce a heavy thick porridge. Salt is added and it is allowed to cool before feeding.

Flax or Linseed

Linseed is the seed of the flax plant. It is high in protein and oil. Be cautious not to use too much - horses stomachs cannot tolerate high levels of fat. Introduce it slowly to the horse's diet and never feed more than two cups per day (based on an average mature horse.) It is used to put weight on thin horses and adds gloss to the coat. Because of its toughness, linseed must be boiled so that the horse can digest it. It may be soaked for 24 hours and then boiled slowly with frequent stirring until the grains are soft. After boiling the result is a jelly-like substance.



Weights of Feed

A simple **rule of thumb** for feeding the average saddle horse is to provide about **2.2 percent** of the horses body weight in feed on a daily basis.

Feed all ration ingredients on a weight basis.

It is important that you know how to feed your horse to adequately meet its needs. Ration is the term used for the amount of feed a horse receives. Each horse is different and requires a different ration. The size and age of a horse, the temperature and weather conditions under which the horse lives, and the amount of work it will be doing affect the size of the ration a horse requires.

To ensure proper amounts of a balanced ration, feed according to animal weight.

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Most families have a small scale for measuring portions or use a bathroom scale. If you do not have a small scale take a plastic bucket and weigh it on a bathroom scale. Take the total weight of the bucket and divide it to get your estimated weight per feeding. **Always** recalculate your feed weights when changing batches of feed, feed types or feed suppliers.

Early in Horse Identification you learned how to estimate the weight of your horse using a tape measure. **A simple rule of thumb** for feeding the average saddle horse is to provide about 2.2 percent of the horse's body weight in feed on a daily basis.

Hay or pasture is sufficient feed for a horse that is ridden very little. With increased work, an equal amount of grain should be added as an equal amount of hay is taken away.

For pregnant mares and growing horses it will be necessary to provide grain even though they are not being worked.

If the horse is getting fat (its body uses most of what it consumes) increase the hay portion and decrease the grain portion. If the horse is a wasteful eater it needs its teeth checked. If the horse's work load is increased, the grain portion should be increased and the hay portion decreased.

Getting a feed analysis done will allow you to balance your horse's ration based on nutrient requirements for the horse's size and use.

Salt and Minerals

Salt is required for many body functions. A salt block or loose salt lick in your horse's pen or pasture will allow the horse to have as much salt as it needs. The iodine requirements can be satisfied by using salt blocks that are iodized. Loose salt is recommended for the winter as horses won't lick enough from a block. Horses require additional balanced calcium and phosphorus so a 1:1 livestock mineral should be fed.

Feeding Horses in Light Work

Horses ridden for pleasure, basic equitation or trail riding 3 to 5 times a week are considered to be horses in "light" work. You can often meet the additional nutrient requirements of horses in light work simply by increasing the amount of good quality hay you feed, without adding grain to the diet (Table 1 Ration 1). Alternatively, some horses may do better with a small amount of grain added to the diet (Table 1 Ration 2 or 3).

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Feed	Ration 1	Ration 2	Ration 3
Alfalfa/Grass Hay	20 lbs (9 kg)	14 lbs (6.5 kg)	--
Grass Hay	--	--	16 lbs (7.25 kg)
Oats	--	3-4 lbs (1.75 kg)	--
12% Grain Mix	--	--	3-4 lbs (1.75 kg)
18:18 Mineral	1 oz (28 g)	1 oz (28 g)	1 oz (28 g)
TM salt	free choice	free choice	free choice

Feeding Horses in Moderate Work

“*Moderate*” work includes barrel racing, ranch work, team penning, cutting, and jumping, amongst other activities. Horses in moderate work usually require additional grain to the diet, because they may not be physically capable of eating all the hay needed to provide adequate energy in the diet (Table 2).



Feed	Ration 1	Ration 2	Ration 3
Alfalfa/Grass Hay	25 lbs (11 kg)	15-17 lbs (7-8 kg)	--
Grass Hay	--	--	18 lbs (8 kg)
Oats	--	5-7 lbs (2-3 kg)	--
12% Grain Mix	--	--	5-7 lbs (2-3 kg)
18:18 Mineral	1 oz (28 g)	1 oz (28 g)	--
TM salt	free choice	free choice	free choice

Feeding Horses in Intense Work

Horses competing in Quarter horse, Thoroughbred or Standardbred racing, endurance riding, or polo are performing “*intense*” work. These hard working horses usually require large amounts of grain to meet increased energy needs (Table 3). A dietary fat source should be considered for horses in heavy work. Substituting some of the grain with a vegetable oil (corn, canola, soy, etc) can reduce the amount of grain required, thereby decreasing the risk of colic and laminitis associated with high-grain diets.

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Table 3: Examples of Feeding Programs for 1100-lb (500-kg) Horses in Intense Work.

Feed	Ration 1	Ration 2	Ration 3
Alfalfa/Grass Hay	15-17 lbs (7-8 kg)	--	--
Grass Hay	--	17-19 lbs (8-9 kg)	17-19 lbs (8-9 kg)
Oats	10-11 lbs (5 kg)	--	--
12% Grain Mix	--	10-11 lbs (5 kg)	8.5-9.5 lbs (4 kg)
Oil (corn, canola, soy, etc)	--	--	1 cup
18:18 Mineral	1 oz (28 g)	1 oz (28 g)	1 oz (28 g)
TM salt	free choice	free choice	free choice

Winter Care of the Horse

Cold weather can take the joy out of riding so the horse is often forgotten during the winter. Many horses are turned out on old pasture or cropland to forage for the winter. Watch your horses to make sure they are not losing weight. If they begin to, increase their feed.

There are a number of things we can do to make our horses more comfortable. A horse that is well fed does better for several reasons. The body has the nutrients it needs to maintain itself and produce body heat. If the weather becomes very cold increase the amount of feed to provide extra energy to keep the horse warm. A useful rule of thumb to use when calculating the feed a horse needs when it is cold is **for every degree below minus 15 degrees Celsius, increase feed by 2 ½ percent (or ½ pound per degree for the average horse).**

For winter maintenance, it is best to feed increased hay, as it gives off more heat during digestion than grain does. Increase the hay until it is no longer practical, then add grain if necessary. This will be in the 2 ½ to 3 percent of body weight and will depend on the quality of the hay.

Horses must have clean free choice water to drink. The water should be warmed slightly (two to three degrees Celcius). A horse eating snow will feel the cold more than a horse that has water supplied daily. The interior heat from its body will have to be used to melt and warm the snow - using more energy (feed). A horse on dry feed during the winter must have access to water, not just snow.












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A horse that is being ridden during the winter may also need extra feed. Take extra care when riding the horse in winter. The footing is not always solid. This makes slow gaits the safest. Even a horse in good condition will sweat. Horses with a heavy haircoat may overheat if exercised extensively. Do not turn the horse out until it is dry. If the horse is turned out damp it may catch a chill.

Horses do not need to be kept inside during the winter, but they do need shelter from the wind. Wind is a problem because it cools the horse down faster than cold temperatures alone. For horses being kept on pasture, trees, bush and hills are good protection. Open front shelters are also excellent since not everyone has barn space for horses. Some people do keep their horses in the barn for the winter. These need to be turned out for exercise. Horses that are turned out during the day after being kept in a heated barn should be blanketed. The only problem with blanketing is that if the horse sweats under the blanket it may possibly become chilled because it takes so long to dry, so check your horse regularly and remove the blanket on warm sunny days. Always be sure to keep the blankets clean and mended.

Feeds a Horse Should NOT Receive




Not all feeds found on farms are safe for horses. Some of them can prove fatal. Here are some things to avoid:

-  Urea (non-protein nitrogen supplement)
-  Rumensin (an additive found in prepared livestock feeds. It causes death in horses.)
-  Added Selenium (ask your local livestock specialist)
-  Frozen Silage
-  Commercial cattle and chicken feed or any feeds formulated for other types of livestock.
-  Mouldy hay (particularly clover)
-  Salt water
-  Mouldy grain
-  Treated grain intended for seed
-  Hay containing blister beetles or known poisonous weeds
-  Large amounts of bread



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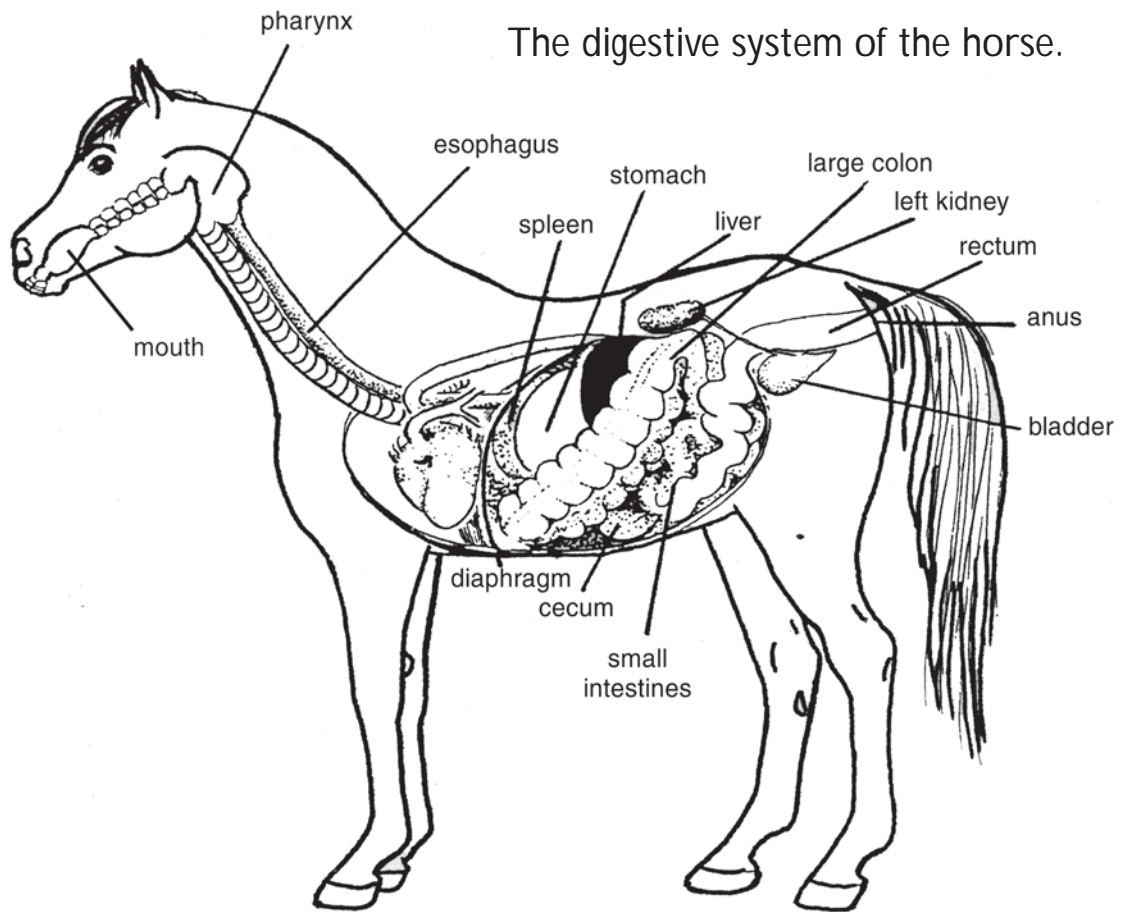
Feeds a Horse Should NOT Receive (continued)

-  Poisonous plants (Japanese yew; white snakeroot; leaves from black walnut, red maple, apricot, oak and apple trees; some fescue grasses, bracken fern, horsetail, deadly nightshade, poison hemlock, larkspur, milkweed, jimson weed, rhubarb leaves, ragwort and oleander).
-  Don't permit your horse to lick old fertilizer bags (ammonia poisoning), old paint, pesticide containers (arsenic poisoning) and discarded batteries (lead poisoning).
-  Feed additives, such as growth stimulants and antibiotics, have not been proven beneficial to the horse. These products should be avoided.

Horse Digestion

The horse has a different digestive system than other farm animals. Although the horse has a single compartment stomach (like people, the pig and the dog), the horse can utilize roughage like the cow or sheep which are ruminants (animals that use four stomachs to break down forages). This is possible because the horse has an unique type of large intestine.

Part	Primary Purpose
Teeth	grind
Tongue	moves food and mixes with saliva
Pharynx	muscles force food down
Esophagus	constricts and moves food downward
Stomach	adds digestive fluid (acids & enzymes) to breakdown fat and protein
Small Intestine	further breakdown and absorption
Cecum	water storage tank, breaks down roughage and absorbs nutrients
Large Colon	further breakdown of roughage to carbohydrates (energy)
Small Colon	most of the fluid reabsorbed here
Rectum	feces formed here, about 25% solid and 75% water
Anus	feces passed out here



The parts of the horse's body involved in digestion include salivary glands and teeth, stomach, small intestine, cecum, large colon, small colon and rectum. The liver and pancreas also contribute to the digestive system. The total length of the system is about 27 metres (90 feet) and the capacity is about 227 litres (50 gallons). The complete digestive process, from time of eating until the expulsion of the feces takes three to four days.

The Salivary Glands and Teeth

The digestive process begins in the mouth where the food is ground up by the molars and mixed with saliva. Saliva is discharged into the mouth from ducts located inside the cheeks, on the floor of the mouth and under the tongue. Saliva facilitates swallowing and helps convert the starches in the food into sugar. The rate of flow of the saliva is determined by the moisture content of the feed. Grinding is accomplished by the lateral (side to side) movement of the lower jaw against the upper jaw. If your horse has difficulty eating grain or is not doing well, have its teeth checked. Their molars (grinding teeth) may have sharp points which can damage its tongue or cheeks. Floating or rasping (usually a veterinary procedure) of the horse's molars and pre-molars as necessary will improve digestion.

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Pharynx and Esophagus

After the food has been ground and thoroughly mixed with saliva, it is moved to the back of the mouth where the muscles of the pharynx force the food into the esophagus and into the stomach. Food moves down through the esophagus by successive waves of muscular constriction. These muscles only allow movement in one direction (towards the stomach), and prevent the animal from vomiting.

Stomach

In the stomach, glands located over about half of the lining secrete gastric juices which are added to the saliva-soaked food. Gastric juices consist mainly of water, 0.3 percent hydrochloric acid and enzymes (pepsin). The action of the enzymes breaks down vegetable fats and changes proteins into a form that can be absorbed by the body. As the food warms up to body temperature, combined with the fluid conditions inside the stomach, the food begins to break down. The enzymes work best when the stomach is less than full.

Small Intestine

The small intestine is suspended from the underside of the backbone by a membrane called the mesentery. The intestine, like the stomach, secretes digestive juices through intestinal glands. Enzymes from the liver (bile) and pancreas are also secreted. The rate at which the food is broken down is increased. The food breaks down into small molecules that are absorbed through hair-like “*villi*” that cover the wall of the intestine.

Cecum

The cecum is the first part of the large intestine. It is a unique structure that allows the horse to utilize roughage because of micro-organisms that help to break down woody material. It is also known as the “*water gut*” because it has a capacity of about 36 litres (eight gallons). In addition to digesting roughage and absorbing nutrients, it serves as a reservoir for storing water for the system.

Large Colon

In the large colon the bacterial action continues to break down the fibrous portion of the food, releasing carbohydrates. This action can take several days, which is the reason that the large colon is so large: three to four metres (10-12 feet) long, about 25 centimetres (10 inches) in diameter, and can hold about 91 litres (20 gallons).

Small Colon

In the small colon, much of the fluid content is re-absorbed into the horse's body.

Rectum

When the residue of the food moves into the rectum, it is pressed into the shape that characterizes horse droppings. The droppings of a healthy horse consist of 25 percent solid material and 75 percent water.

Feed Problems

The feces (manure) from your horse can be an indication of health. Check them routinely for any sudden change in consistency, colour, odour, or amount. Any of these changes could be the first symptoms of a more serious problem.

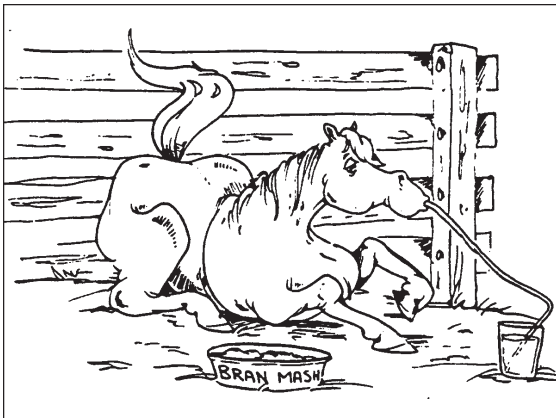
Most feeding problems are prevented by ensuring that good feed management practices are followed. However, some problems may occur. Be observant and feed horses as individuals. A good horse person should know the signs of a well-fed, healthy horse and any signs to the contrary should be a warning and corrected.



Bolting Feed

Bolting feed (grabbing at the feed and swallowing without adequately chewing it) can be a serious problem and often causes colic reactions in horses. Feeding horses with this habit at the same time every day and offering some hay before grain can help to reduce nervous energy. Spreading grain out thinly at the bottom of a large manger or putting large (softball-sized) rocks in the manger can help slow the horse down in its eating habits.

Feeding a Horse with Heaves or Respiratory Problems



Dampen all hay and loose grain to reduce any dust or feed the horse a pelleted ration. Never feed mouldy or dusty hay or grain. Keep the horse outside as much as possible, away from dusty pastures, stalls and arenas.

For respiratory infections, feed low to the ground to encourage nasal discharge.