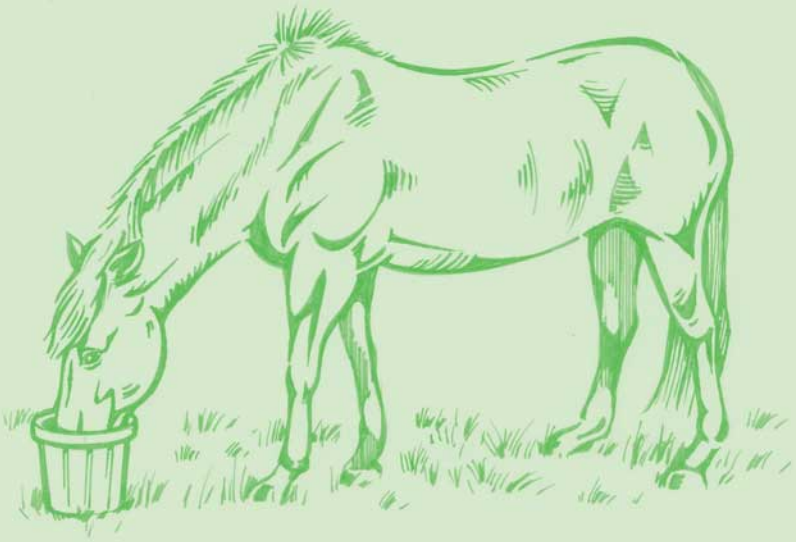
ADVICE ON

Basic Feeding



DODSON & HORRELL LIMITED
Feed Specialists

The British Horse Society
Registered Charity No. 210504

THE DIGESTIVE SYSTEM

Everyone has heard the expression that 'one end bites and the other end kicks!', but it is what happens in between that affects the way you should feed your horse

The horse and human digestive systems do actually have quite a lot in common, although it is the differences which you must be aware of, if you are going to feed your horse well and healthily.

EQUINE MOUTH - 'THE END THAT BITES!'

The psychological need to chew is important in a horse. Chewing is also important as horses only produce saliva when they chew, so the more chews they make the more saliva they produce. Saliva is important as it acts as a lubricant and also as a source of bicarbonate ions.

Horses secrete 10-12 litres of saliva a day depending upon the type of food they are eating. Equine saliva is high in mucus but contains no amylase (the enzyme that digests starch). As well as bicarbonate ions, the saliva contains potassium and sodium.

Lips
Strong, mobile and sensitive are, the lips are used to shift through feed. Horses can sort out small stones and worming granules from their feed! The upper lip is used to place forage between incisors (front teeth) for biting.

Tongue
Moves the food that has been cut by the incisors to the back teeth (molars) on both sides of the jaw for chewing.

Teeth
The incisors (front) and molars (back) continue to grow to compensate for wear. The space between the rows in the bottom jaw is less than that of the upper jaw. This allows the horse to move his teeth in a sideways or circular movement which shears or grinds the food.

HUMAN MOUTH

Our salivary glands are stimulated by sight or smell of food (feel your mouth water when you smell the bacon butties at a show) and also by the sympathetic nervous system.

Food and pain in your mouth will stimulate saliva, fear will inhibit it (remember how dry your mouth goes just before you go in the collecting ring).

The average amount of saliva we produce in twenty-four hours is 1-11/2 litres. The rate will depend on when you last ate or exercised but the basal flow rate is 0.5ml per minute.

THE STOMACH

Relatively speaking the stomach is much smaller in the horse than it is in humans. Humans store fat around their stomachs, horses do not. Horses with a big grass belly are storing bulk, but if you feel under their tummies, you will not find fat. There is no need to comment on us! The first chamber the food reaches after it has been chewed is the stomach.

% of the Digestive System

	Stomach	Small Intestine	Large Intestine
Horse	10	30	60
Human	30	35	35
Dog	60	30	10

The human stomach is 'j' shaped and is relatively vertical in tall people but more horizontal in short people. We produce two to three litres of gastric juice a day that contains water, hydrochloric acid and pepsin.
A typical meal is emptied from your stomach in about four hours - less if the meal is liquid - and can take as long as six hours if the meal is high in fat. We start to digest protein and also some fat and carbohydrate.

The horse's stomach is small because he is a trickle feeder and does not need to store food in the stomach. So, most of his food leaves the stomach within two hours.

Do not feed a 16hh, 500kg horse more than 2.25kg of hard feed in one meal; a 13.2hh, 250kg pony more than 1.5kg, otherwise you will overload their stomachs.

Horses also start to digest protein in their stomachs.

THE SMALL INTESTINE

Is similar in both humans and horses - the difference is the size; also humans have a gall bladder but horses do not.

In the horse, the duodenum is 1m long, the jejunum 25m long and the ileum about 50cm long. The entire small intestine has a volume of 40-50 litres.

The small intestine in both horses and ourselves is the major site of digestion and absorption of starch into simple sugars; proteins into amino acids; fats into free fatty acids and vitamins A, D and E and some minerals.

The small intestine of horses and humans contains a large amount of bacteria and this is the site that probiotics target.

THE LARGE INTESTINE

Is where the difference between our systems is most marked.

Horse - the first part of the large intestine is the caecum (our appendix) which is a blind sac, about 1m long and can hold 25-30 litres (6-7 gallons). The main role of the caecum is the digestion of fibre (cellulose) by millions of protozoa, fungi and bacteria. In addition, the bacteria synthesise B vitamins and vitamin K, so if your horse is eating enough fibre and its hind-gut is functioning 'normally' there is no need to feed additional B vitamins.

The second part of the large intestine is the large colon, which looks a little like a line of four sausages. It has four chambers which narrow to allow the tube to bend around the body. The large colon is 3-4m (10-12ft) long and has a volume of 50-70 litres. Its diameter is 50cm (20") which narrows at the bends to 7-10cm (4-6"). Next is the small colon which is 3m (10ft) and this ends in the 30cm long rectum.
Water is re-absorbed from here and most food will reach the large intestine within three hours. Fifty percent of a cereal feed is excreted after 36 hours and 95% after 65 hours.

WORKING OUT HOW MUCH TO FEED

Horses and ponies are just like people in so far as two people or two horses can eat the same amount of energy and one will gain weight and the other does not.

Two factors have to be taken into account when working out the energy requirements for horses, the current bodyweight of the horse and its workload. However many other factors have an influence on how the horse uses the energy :- the horse's temperament, whether it is clipped, whether it has access to good grazing, the ability of the rider, the weather, is it stabled for part of the day, is it kept alone, the quality of the hay it's fed in the winter.

Most horses should eat 2.5% of their bodyweight on a daily basis in order to keep the digestive system healthy and to keep the horse occupied as horses evolved to eat up to 18hrs a day. The main part of their diet should be forage (hay, straw, grass and high fibre chaffs).
The problem comes when we replace low energy bulky feedstuffs (think lettuce and celery and fruit and veg for ourselves) with higher energy, less bulky feeds (similar to cheese, meat, cakes, pasta) which unless the horse is working will provide the horse with more energy than most of them require.
Horses maintained on forage diets that are in light work will usually receive enough energy, however they will be deficient in protein, vitamins, mineral and antioxidants and feed manufacturers have formulated low energy feeds for this reason.

Horse owners need to be objective when they look at how much energy their horse needs. All owners should be able to feel the ribs of their horse in the same way as you can feel stair banisters under a velvet curtain. If their horse is gaining weight then they are feeding too much energy, if their weight stays the same they are balanced for energy and if they are losing weight they are not getting enough energy.

There are 'tools' available to horse owners; everyone should use a condition score card and a weightape on a fortnightly basis, and all reputable feed manufacturers have Nutritional Helplines.

Once an owner knows the weight of their horse, they need to feed 2.5% of that weight to the horse. If the horse is putting weight on, then the food should be low in energy and high in bulk; if the horse is losing weight then some of the low energy feed should be replaced with food which is higher in energy.

Owners need to be aware that overweight horses are more likely to develop insulin resistance as they get older (a little like late onset diabetes in people), they will have more trouble with legs, lungs and heart and their feet are only able to carry a finite load and the laminae will weaken if this is continuously exceeded over a period of time.

WORKING OUT HOW MUCH TO FEED

There are tables available which give the minimum daily requirements for horses of many of the nutrients they require. The information given in these tables is based on the body weight of the horse and the workload they are doing. Other variables will also be considered by the Nutritional Helplines. These will include:

- Age
- Temperament
- Body condition
- Management - stabled, out (what's the grazing like?)
- Forage being fed
- Current diet
- Where kept - climate, geography, in company
  - yard environment
- Any dietary related clinical problems

However, to be as accurate as possible you need the body weight and workload - of your horse and until you have got used to feeding, we would recommend that you phone a Nutritional Helpline with the above information for advice.
You should keep a note of your horse's weight and weigh at the same time of the day on a regular basis.

Horse's Name
Date
Time of Day
Weight on Tape
Condition Score
Neck -
Middle -
Bottom -

After establishing the weight of the horse you need to establish whether you need a diet to:

- Maintain weight
- Increase weight
- Lose weight

So, all weight estimations must be done alongside a condition score.

CONDITION SCORING

In order to decide whether you need to increase or decrease the energy of the diet, you need to pinch an inch or two to establish fat cover.

Work at Warwickshire College using several methods of condition scoring has established that the Carroll and Huntington method of 0-5 is the most repeatable and reproducible.

Some tips before you start:

1. You are scoring for fat cover only (do not take muscle into account).
2. You cannot condition score by eye alone, you have to feel.
3. You are feeling for fat cover over the skeleton.
4. Divide your horse into three areas - neck, middle and rear and score each area separately.

Horses store fat in different areas just like us. Some of us store fat more on our legs, some on our hips, some our tummies, some all over! Once you know where your horse is more likely to store fat this can become your early warning sign!!

The neck/shoulder
Horses store fat on the crest of their necks and over their shoulder blades. Feel over these areas and match the condition score.

The middle (rib cage / back bone)
Fat is stored over the rib cage and either side of the backbone. Can you see/feel the ribs? Can you feel the backbone? Does the back fall away quickly from the backbone or is a tabletop developing?

Ignore gut fill - horses do not store fat on their bellies.

Backside
Can you see the backbone as it meets the tailbone? Can you see the tailbone or feel it? How much fat is stored on the quarters?

Give each area a condition score.

Be aware of the area with the highest score and keep an eye on this.

Add the scores and divide by three to give a body condition (fat) score.

WEIGH YOUR FEEDS

A nuisance, maybe, but not only do scoops vary in size but how full they are filled also varies.

Consider that a large, round, metal scoop with a wooden handle holds 1.5kg. of coarse mix, 1.75kg. of nuts if "flat" filled. Heaped it weighs 25% more. If you are feeding twice a day, 7 days a week, that is considerably more nutrients than perhaps your horse needs. It only requires a little extra energy over requirements to increase weight considerably over a period of time. (Cut out that two finger Kit-Kat you have with coffee every day and you will lose half a stone in a year!!).

It is also important to weigh forage, especially haylages or short-chop chaffs.

Whilst in humans I would discourage an unhealthy obsession with bathroom scales, an unhealthy obsession with the weight of our horses, their feed and their fat score is a good thing to develop.

Usual assessment should not be relied on - think of the human scenario - your mother thinks you are not eating enough (spending too much time with the horses), whereas your boyfriend / husband thinks you're fat (too much time with the horses!!).
There are as many opinions on our equine counterparts - do develop a less subjective and more objective method of assessing them, which in turn will lead to better dietary advice and more accurate recommendations.

CHOOSING A FEED

Many new owners are confused at the huge choice of feeds available; however the choice is no greater than the choice of rugs, bits or even jodhpurs available. Your choice should be based on your knowledge of the digestive system, which is why the first part of this leaflet is so important.

Base all diets on forage, whether that is hay, grass or haylage or a hay replacer. Your horse must eat more than 1.5% of his bodyweight as fibre. You then feed a concentrate to balance the deficiencies in the forage.

Follow the rules of feeding and you will find it difficult to get it wrong!!
The rules of feeding really reflect the horse's digestive system so try to imitate as natural a regime as possible. It is important to remember two basic facts:
the horse's teeth are designed to eat grass, and the horse has a psychological need to chew.
If you follow the rules you are less likely to have problems with your horse, either physically or mentally. Regardless of work load, temperament and type of horse, the guidelines given in this section must be followed.

FEED LITTLE AND OFTEN

The horse's digestive system was designed to have a slow, constant flow of food passing through it. One of the ways of avoiding problems is to feed our horses as they would eat in the wild, where they spend eighteen out of every twenty-four hours eating! This type of feeding is called 'trickle' feeding because there is always a small amount of feed trickling through the gut.
The horse's stomach is very small and it does not have a large storage space for food. A 16hh or 500kg (1,100lb) horse has a stomach the size of a rugby ball. His stomach can hold up to 10 litres (2 gallons), which is equal to a half-filled black bucket of 2.5kg (5lb) capacity, before the food is expanded by saliva and stomach juices. Scale this down to pony size and you can appreciate that the stomach is really very small.
If you overload the stomach, the food is pushed through the gut too fast and is not digested properly. When you overload the stomach undigested food reaches the large intestine. In the large intestine there are millions of bacteria which break down the food for the horse. Friendly (useful) bacteria will die as they cannot survive the conditions made by undigested food and the unfriendly (bad) bacteria grow. Poisons are produced which can cause stomach ache (colic), laminitis, swollen legs and other problems.
In order to ensure proper digestion and to avoid overloading the stomach, there are a number of measures you can take:

Dilute hard feed with lots of chaff
Feed hay before and after concentrates.
Feed three to four small meals rather than two larger meals.
Mix hard feed through hay.
Feed carrots and apples with hard feed so the horse takes longer to eat.

FEED LOTS OF ROUGHAGE (FIBRE)

The horse is a herbivore and his digestive system spends the most time digesting the food that is most important to the horse. Food spends up to two days in the large intestine, which is where fibre is digested, and between forty-five and seventy minutes in the small intestine where other food is digested (cereals, for example).
The more roughage a horse gets, the happier the friendly bacteria will be. If he is fed lots of cereals and/or spring grass instead of roughage, the friendly (helpful) bacteria die and the unfriendly (bad) bacteria grow, thus producing poisons which can cause laminitis, poor performance and stomach ache.
To provide adequate roughage, you must feed sufficient rations of hay. However, if your horse is getting 'fat' on hay, feed half the ration as oat straw. Weigh the hay so that you know exactly what the horse is consuming; it might not be enough. Also, feed fibre based feeds, and bed the horse on straw.

FEED ACCORDING TO WORK LOAD, TEMPERAMENT AND SIZE

Obviously if you provide your horse with more feed (energy) than he requires, he will get fat. Sometimes you do not notice until it is too late and the horse will become slow and sluggish. He will then be suffering from strain on the heart, lungs, legs and muscles. Alternatively, horses can become over-excited (depending on their character) when fed a lot of food; not a lot of fun and not very safe for the horse or rider.
The best way of monitoring a horse's weight is to measure your horse's heart-girth fortnightly and note it down. You will soon see if his weight is changing.

MAKE NO SUDDEN CHANGES

There are ten times the number of bacteria in the horse's gut than there are cells in the whole of the horse's body. Every time you change the feed (including hay and pasture) not only do the bacteria have to adapt, but so do enzymes. If the changes are quick, many of the helpful bacteria will die and produce poisons that can cause laminitis, colic or at least grumpiness.

One of the commonest reasons for changing the diet suddenly is running out of feed, so make sure that you monitor your feed supplies so that this never happens. If you decide to alter the diet, should be done for good reason and implemented gradually over a period of ten to fourteen days. Do not wait until you have run out of the horse's usual feed before buying a different type - whether it is hay or hard feed; instead introduce the new type while still feeding the usual diet.

KEEP TO THE FEEDING ROUTINE

Horses are creatures of habit. They will collect at the field gate when it is feeding time or start banging on stable doors. Fights can occur between groups of horses waiting for their owners to feed them Therefore, it is extremely important to establish a feeding routine and feed at the same times every day. This means managing time effectively, planning ahead, and if necessary or possible, sharing feed times with other owners so that you can organise a rota.

DO NOT WORK FAST AFTER FEEDING

Exercise causes blood to be diverted away from the digestive system to the heart, lungs and legs. Unless the food has been absorbed before exercise starts, it will not be digested properly.
A full stomach will press on the lungs. If you work the horse fast after feeding, the lungs will not be able to fill with air properly and your horse may not get enough oxygen to his muscles. Also, undigested food will upset the bacteria in the large intestine: some will die releasing poisons, and stomach ache may occur.
Leave at least two hours between feeding and exercise, and better still exercise first and feed later.

FEED SOMETHING SUCCULENT

The best succulent to feed a horse is grass. Grass contains 80-90 percent water and is the natural feed for a horse. In comparison the food a stabled horse gets - hay and cereals for example -is very dry.

Ideally, turn the horse out daily, but at the least add carrots, apples sugar beet, dandelions and turnips to the feed every day.

ALWAYS PROVIDE FRESH CLEAN WATER

As pointed out earlier, water is vital for keeping a horse alive. If a horse cannot drink, he will rapidly stop eating.
If he has been deprived of water, he may drink large quantities (a bucket or two). This may wash the food out of the stomach. Do not worry, however, if your horse drinks a small amount of water during or after his feed.
Each day you should scrub the water bucket out thoroughly; refill with clean water; and make sure it is secure so that horses cannot kick it over.

WEIGH FEEDS AND HAY

You may often find that you are overfeeding because you are feeding by volume not weight, so you should weigh foodstuffs regularly to ensure that quantities remain consistent and correct.
Don't forget that pellets weigh more than the same volume of a coarse mix.
The best way of checking food weights is to empty the actual quantity of everything you are feeding into separate plastic, non-leakable bags. Take them home and weigh on the kitchen scales.
Don't forget to note down the weight.

If you want more information and to read more then look out for the new BHS book.....

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