Is forage the best way to provide all the nutrients a horse needs to stay healthy?


# fibre all a horse needs?

Whilst we know that horses have evolved to survive on forage alone, we have traditionally found that it is generally not sufficient to maintain, particularly in performance horses, a consistent, acceptable condition and to meet the increased demands their riders place upon them. However, the advent and more widespread use of modern preserved forages has sparked debate as to whether this now holds true and whether more nutritious fibre products could indeed be all that today's horses need.

## What does forage provide?

So what is it that forages provide nutritionally and, perhaps more importantly, is there anything they may be lacking that needs to be provided from another source? The obvious nutritional element of any form of forage is fibre, which helps meet two of the horse's most basic needs; energy (calories) and physical bulk, without which the digestive system could not function. The development of so called "super fibres", like soya hulls or sugar beet pulp which are highly digestible, has also seen an increased use of fibre as a slow release energy source in compound feeds.

## Fibre - energy and bulk

Fibre is broken down by a population of bacteria, predominantly in the horse's hind gut and caecum, and the energy derived in this way is released slowly so tends not to cause "fizziness" or excitable behaviour. Energy is needed to fuel all body functions, from temperature maintenance to muscle movement, and horses will vary in how efficiently they use energy with any excess generally laid down as fat! One "spin off", from the fermentation of fibre by bacteria in the hind gut, is the generation of heat, which helps to warm the horse from the inside out, so horses whose forage is limited tend to require warmer rugs to help them maintain condition.

Another great benefit, particularly to stabled horses, is the length of time it takes to eat both long (hay, haylage) and short chopped forages (oat straw and alfalfa chaffs) thus satisfying their physiological need to chew and helping to mirror natural grazing behaviour. This can help to reduce stereotypical behaviours such as cribbing as well as the incidence of gastric ulcers and other stress related conditions. A fibre-based diet will also encourage better utilisation of any compound feed as the gut is helped to remain healthy.

## Protein

Another nutritional component essential to all horses, and contained to varying extents in different forages, is protein. This provides the building blocks for all body tissues so is in particular demand in the bodies of youngstock, broodmares and performance horses, as well as those recovering from injury. The quality of the protein in a horse's diet is as important as the quantity, since some of its component amino acids cannot be manufactured by the horse's body so have to be provided in the diet. Hay and haylage contain up to 6 – 8% protein, so are able to satisfy some, or all, of the horse's daily requirement depending on his demands. Alfalfa, on the other hand, not only contains much more protein, at 12 – 15%, but the quality ie. the level of essential amino acids it provides, is also higher, making it much more suitable as a protein source for performance horses and breeding stock.

## Vitamins and Minerals

Alfalfa is also a good natural source of some vitamins and certain minerals, including calcium, which is vital for the efficiency of certain body functions and an integral tissue component. What's important here is its relationship with the mineral, phosphorus; an essential mineral in its own right but which, if present in the diet in excess, can reduce the availability of calcium to the horse. The diet therefore has to contain these two minerals in a particular ratio (in this case 1.8-2:1) to ensure that sufficient of each is available for the horse's body to use. Many minerals have this sort of relationship and must again be present in certain proportions to be of use, so more of

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one particular element in a feed or supplement is not necessarily better if the ratio to another mineral is wrong.

For horses whose protein requirements are higher than average quality hay or haylage can supply, additional dietary protein source is necessary. We could replace some, or all, of the forage with alfalfa, as this would be satisfying fibre needs whilst also providing the extra quality protein. However, since alfalfa does not contain a full spectrum of other essential nutrients, mainly vitamins and minerals, a supplement or balancer is recommended to address these shortfalls. Should a horse's diet provide more protein than he requires, his liver will simply break it down and pass it on for excretion in the urine. Feeding large volumes of alfalfa (6 -10kg per day) could over supply protein which, whilst not necessarily causing health problems, will result in increased production of ammonia-rich urine; not ideal for the stable-kept performance horse!

## What else can we feed?

Fibre from forages is essential to the functioning of the equine gut and, therefore, the survival of the horse, but is forage the best way to provide all the nutrients a horse needs to stay healthy and perform to the levels we expect? We know it will provide slow release energy for work but a problem arises when the demand for energy exceeds the amount that can be provided by forage. A horse has a limited appetite, which research has been shown to be 2 -2.5% of bodyweight, so a 500kg horse can be expected to eat 10 – 12.5kg per day. If 10 – 12.5kg of forage, however nutritious, cannot supply sufficient energy, or other nutrients for that matter, then part of it has to be replaced with a more concentrated source of energy and nutrients to keep the total feed quantity within the horse's appetite capacity. This is where the use of non-forage feeds has proved its worth.

Cereals have traditionally been fed to meet the energy shortfall of an all forage diet. They are concentrated sources of calories in the form of carbohydrates, usually starch, which, unlike fibre, is digested by the horse in the small intestine, or foregut. As individual food sources, none provides all the nutrients that a horse needs, which is why manufacturers have developed modern fully balanced "compound" feeds to be fed alongside forage. The starch content of these energy sources has increasingly been tarnished as its over or mis-use is now implicated in the cause of metabolic and digestive disorders such as colic, laminitis and tying up. It is however present in some forages, particularly alfalfa, so is important to remember that is not necessarily an unnatural ingredient in a horse's diet.

## Safe Cereals

What varies among the types of grain fed to horses is the digestibility of the starch content, with oats being the most digestible, hence their enduring popularity. The starch in other cereals may be less easily digested in its raw state which is why feed manufacturers cook the grains to gelatinise the starch and make it more digestible to the horse. Micronising has so far been found to be the most effective cooking method and renders up to 90% of the starch content gelatinised and therefore more digestible. These cooked cereals are much "safer" to feed to the horse than uncooked cereals since the chances of them being digested where they should be, in the foregut, are maximised. It is the passing of undigested starch on to the hind gut which causes the main problems.

Cereals get a lot of bad press, most of which fails to take into account the fact that they may have been cooked to reduce any risk, or the levels at which they are being fed. It's worth considering here what constitutes a "high cereal" diet, as feeding 3.5kg (2 Stubbs scoops, the recommended amount for a 500kg horse in light to moderate work) of Top Line Conditioning Cubes per day, alongside ad lib hay, would certainly not fall under that heading. The energy requirements of racehorses, for example, mean they are commonly expected to eat over 7kg of a, generally oat-based, performance feed per day alongside, perhaps, 4 – 5kg of forage. That would be classed "high cereal" and requires careful management and small meals sizes to avoid digestive, or other, upsets.

## Careful feed management

So, if a horse needs additional calories, which is possible even when the workload is quite light, it makes sense to provide a small volume of a concentrated, highly digestible source so as to take up as little of his appetite capacity as necessary. This allows him to continue to eat large volumes of lower energy forage to satisfy his physiological needs. Feeding in small volumes also matches the horse's normal feeding patterns and avoids overloading the foregut with large volumes of starch which it cannot handle. Due to the limited capacity of the horse's stomach, meal sizes should not exceed 1 – 2.5kg (1 – 2 Stubbs scoops) for the average horse, and energy intake should match and not exceed the horse's needs.

## Different ingredients

Other feed ingredients are particularly good sources of other nutrients and experienced feed manufacturers are able to select and prepare the best components in the right proportions for a fully balanced diet. Soya, for example, is a particularly rich source of good quality protein whilst also containing oil which is especially energy dense, providing 2 ¼ times as many calories as carbohydrates from cereals. Oil contains essential fatty acids, like Omegas 3 and 6, which play important roles in some body functions and structures and different oil sources provide these at different levels. Whilst many of these feed ingredients will contain some vitamins and minerals, the safest way to meet daily recommended intakes is to use a carefully balanced mix of these micronutrients from other sources. This is included in a specially formulated compound feed or is the basis for the many broad spectrum supplements available.

## Getting the balance

So where does this leave us? It is widely recognised that a minimum of the equivalent of 1% of bodyweight of fibre per day is necessary for healthy gut function, whatever a horse is doing, whether racing or retired. As we've discussed, even nutritious forages, like alfalfa, still don't represent the whole answer as they may be deficient in some nutrients and yet over supply others. So the horse owner's next step is to decide what to feed alongside forage to fulfil his and the horse's needs. For the horse whose energy needs are met by forage alone, supplementation with either a balancer, like Baileys no.14 Lo-cal or no.19 Performance balancers, will help ensure other nutrient requirements are met. Beyond this though, the best, and most cost effective, diet remains a combination of forage and a fully balanced compound feed.

## Selecting energy sources

Choosing a compound feed, which has been cooked and formulated to be as safe to feed as possible, minimises the risks associated with its feeding, even in larger quantities, providing each meal is kept small. There is now a wide selection of compound feeds available formulated to suit all workloads and temperaments so, by choosing the correct feed for the job and feeding it in the recommended quantity alongside forage, you can ensure that a horse's additional energy and dietary needs are met. If the recommended quantity of a feed provides too many additional calories, it is best to choose a lower energy feed than to cut back the quantity. Compound feeds are all designed to be fed at a recommended level and under feeding will result in a shortfall of some nutrients; balancers can be particularly useful in topping up nutrient levels without calories.

Cereals and compounds also give the horse owner a selection of energy sources in addition to the "slow release" available from fibre. The "quicker release" energy available from cereals may be needed by some more laid back horses or those with high energy demands. Indeed different types of energy are more suited to different types of work, with the slow release from oil and fibre being used at low intensity and quick release, from cereals, at higher intensity. It is worth remembering too that the main food for the brain is glucose which is obtained most easily from cereals. Eliminating all cereals from the diet of a performance horse could limit his ability to concentrate at the end of a long hard race, endurance ride or cross country course, with dangerous consequences.

## All things in moderation

With new ideas and products appearing throughout our lives all the time, horse owners can be forgiven for some confusion over what is now the best approach to feeding, keeping and even riding their charges. Part of the challenge is the fact that horses, like us, are all individuals and what works with one horse may not necessarily work for the next. There is no doubt that whatever we feed, we have to work with the limitations and requirements not only of the horse's physiology and instincts but also of where and how we can keep him and the size of our budget. The challenge is to choose a balanced approach that not only works for the horse but that also helps the rider achieve their goals of a happy, healthy horse able to meet their performance requirements.

For further information or a practical and individual diet for your horse, contact one of Baileys Nutrition team on
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