

WHY DO SOME FEEDS MAKE OUR HORSES SICK?

Are we killing our horses with kindness?

Dr. Tim Kempton

Have you ever wondered why it is that what we feed our horses can so easily and so often make them sick or change their behavior? Many common equine diseases and problems including colic, tying-up, laminitis, Cushing's syndrome, acidosis, poor appetite, unruly behavior, poor performance and developmental orthopedic diseases are all caused by, exacerbated by or can be linked back somehow to what we are feeding our horses.

Why is what we feed causing disease?

We can find at least some of the answers to this question when we look at what horses eat in their natural environment and what we feed our horses in their somewhat artificial, domesticated environment. First we must ask ourselves, how is what a horse eats in its natural environment different to what a horse eats in a closely managed domesticated environment? Let's start to unravel the answers by taking a look at the horse's evolution.

From four toes, to one ...

Millions of years ago, the horse is thought to have been a dog sized animal with 4 toes. This small creature, named *Hyracotherium* was primarily a browser and lived within a protected forest environment. As climatic changes took place, many of the world's forests where *Hyracotherium* lived were replaced by savannah and grass lands. These environmental changes meant *Hyracotherium* was faced with having to eat a diet of low energy, high fiber grasses (which was distinctly different to their somewhat succulent diet they consumed as a browser) and without the protection of the forest they also became easy targets for larger predators. These changes forced *Hyracotherium* to increase in size. The equids increasing size meant increased speed, which allowed the prehistoric horse to outrun its predators. It also meant that the gut was able to enlarge and incorporate the sizeable fermentation chamber we now call the hindgut, whose primary function was, and still is to house billions of bacteria who ferment and extract energy from fibrous plants such as the grasses the horse was now being forced to live on. The hindgut's capacity to ferment and extract energy from grass, in combination with the horse's ability to consume large amounts of forage in a day meant that horses had placed themselves within an environmental niche where not even the ruminants were able to compete.

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Consequently the horse remained and developed into the large, grazing, single hooved animal we know them as today (Budiansky, 1998).

What do we know about a horses 'natural' diet and grazing behavior?

Equines in their natural environment are opportunistic feeders, and will consume whatever is available to them and edible at the time. The modern day horse is primarily a grazer and prefers grasses and grass-like forages, but they will still occasionally browse trees and shrubs. A study conducted in Western Alberta found that 93% of a horse's diet consisted of grasses and grass-like species. The remaining 7% of the diet was made up of forbs, browse and other miscellaneous species such as lichen and moss. In total, these horses were consuming up to 43 different plant species throughout the year. Similar studies conducted in Colorado and New Mexico also found that a horse's diet was highly varied, but was based on grass and grass-like species. It can be assumed that horses, during their time grazing grasses would have eaten some seed heads and grains. However, it can also be assumed that due to a horse's tendency to graze the green, more succulent parts of plants which are higher in energy, seeds and grains did not make up a significant part of the natural diet. In addition, the modern day starchy cereal grains that have been genetically selected and developed for use in the human diet almost certainly did not feature as part of the equids natural diet.

With respect to grazing habits, it is known that horses in their natural environment spend large amounts of time grazing. Studies of wild horses estimate that equids will spend from 50% to 75% of a 24 hour period consuming food (Duncan, 1980; Tyler 1972; Salter *et al.* 1979; Keiper *et al.* 1980).

How has the domestication of the horse changed their diet and grazing behavior?

Horses were domesticated by humans less than 6000 years ago. Upon domestication, horses became an indispensable means of human transport. They were also used for heavy haulage and farm work. While some horses are still used for work their place in western society has changed dramatically, with their main uses now being focused around sport, competition and pleasure. Regardless of their use or purpose, the horse's diet has been changed significantly.

Consider for a moment, where horses in their natural environment roam free, we now keep them confined to box stalls, corrals or small pastures, which dramatically restricts their ability to select their own feed throughout the day. We tend to feed our horses a relatively plain diet, consisting of perhaps one or two types of forage and hard feeds that may contain up to ten different seeds or grains, many of which are high starch cereal grains. For convenience reasons, we also commonly feed horses a small number of large meals each day. So domesticated horses now consume a diet containing less than 15 different species of plants (compared to the natural diet which may contain 40+ species of plants), we have added starchy cereal grains, which were not originally part of the natural diet and we have changed the pattern of eating from continuous intake to large meals.

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So why did we make such dramatic changes to their diets? Aside from the convenience factor, horsemen realized that the use of the horse for work, sport, competition and breeding altered and generally increased their nutrient requirements.

Meeting the domestic horse's nutrient requirements ...

Recognizing that a working or breeding horse had an increased need for energy, early horsemen began feeding starchy cereal grains. Grains were chosen because they were cheap, readily available and palatable for the horse. What these horsemen didn't know was that, because the modern day high starch cereal grains had not been a part of the horse's natural diet, horses were not well equipped to digest and utilize them. While horses have some capacity to digest the starch from cereal grains, this capacity can be easily exceeded. Researchers from the Texas A&M University estimate that horses are capable of digesting 3.5 – 4 grams of starch per kg bodyweight/meal (0.05 – 0.06 oz./lb. bodyweight). Beyond this point it is believed that starch overload into the hindgut will occur, causing problems such as hindgut acidosis, colic, laminitis and altered behavior. Nutrition texts from mid last century mention that horses will become 'food-sick' or colic when fed wheat in an uncontrolled manner. It was also noted that grain feeding could cause 'crippling laminitis, digestive disturbances and kidney disorders'. 'Monday Morning Disease', now identified as tying up was also commonly reported in horse's that were fed grain based diets.

So it has been well known for some time that the addition of cereal grains to a horse's diet can cause several debilitating diseases. The simple answer to preventing these diseases would be to simply remove cereal grains from the diet. However, grains were added to help meet the elevated energy demands of working horses. If they were simply removed from the diet, working horses would quickly begin to lose weight and their performance standards would fall. So, we are left with somewhat of a feeding dilemma. Working horses need to have their energy requirements met; however, meeting them using cereal grains can cause diseases and poor performance.

The question therefore, is how do we meet a working horse's requirements for energy without overfeeding cereal grains? The answer is: by feeding high energy fibers and oils. Because fiber made up such a large component of a horse's diet in their natural environment, they are well equipped to digest and extract energy from it. Likewise, oils have always been present in a horse's diet (as grasses are typically 2 – 3% oil) and thus horses appear to be well equipped to digest oils, even when fed in relatively large quantities of up to 20% of the diet's total energy.

New generation feeds

The sugars and starch in feeds is termed the Non Structural Carbohydrates (NSC). It is believed that feeds containing more than 12% NSC are a major cause of the disease and poor performance of many horses. Some

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so called cool feeds contain up to more than 40% NSC. The opportunity therefore is to feed high energy, low NSC feeds.

CoolStance is a natural, high energy, high fiber, low NSC feed that provides a palatable, safe alternative to cereal grains in the diet of working horses. **CoolStance** allows you to meet the horse's energy requirements without causing the problems typically associated with high NSC diets.

In the next few months we shine the spotlight on some of the following topics, and discuss the role and of low NSC, high energy feeds such as **CoolStance**.

- NSC analysis of commercial horse feeds
- The role and importance of fiber
- Tying up
- Laminitis
- Cushings
- Colic
- Selection of simple and safe feeds for show horses.
- Prevention of disease through diet selection

Cool Stance Quick Facts

1. **What is Cool Stance?** CoolStance is the meat from the inside of a coconut after much of the oils has been removed. The oil extraction process is chemical free and the coconuts come from trees that are not genetically modified.
2. **How does CoolStance supply energy?** CoolStance contains readily digestible sources of energy from fiber, fat and protein
3. **Does CoolStance Contain Starch?** There is less than 2% starch and less than 12% NSC in CoolStance.
4. **How is CoolStance different to other oilseed meals?** The fat in CoolStance is predominantly in the form of saturated medium chain fatty acids. Medium chain fatty acids are easier to digest absorb and utilize for energy than the longer chain fatty acids found in other oilseeds such as sunflowers.
5. **Will CoolStance go rancid?** Because the fat in CoolStance is saturated it will stay fresh for long periods of time.
6. **Which type of horse can be fed CoolStance?** CoolStance is suitable for all types of horses.
7. **Is CoolStance a complete feed?** CoolStance is not a complete feed, and although it does contain a micro-mineral concentration that is 4 to 5 times higher than in cereal grains it may still be necessary to use a suitable vitamin and mineral supplement when you are feeding breeding, growing or working horses.
8. **Do horse like CoolStance?** CoolStance has a unique aroma that most horses like. Because it is unusual, some horses may take a little while to adjust to their new feed, but if you persist, we are sure you will find the effort is worth it.

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