

**ASPECTS of PASTURE that can ADVERSELY AFFECT YOUR HORSE – PART 2 (pages 7 -13)**  
**downloaded from [www.HorsemanshipNZ.com](http://www.HorsemanshipNZ.com)**

**In layman's terms, here are some facts. Think about them and draw your own conclusions!!!**

Calcium excites the nerves and magnesium relaxes them. The brain is part of the nervous system! (Attention Deficit Disorder type symptoms). They 'lose the ability to process information' (can't think straight), you have difficulty getting their attention, they become over-sensitive, spooky and cause accidents and so on.

Calcium is necessary for muscle contraction and magnesium is necessary to release them.  
Horses are 80% muscle.

Lack of calcium/magnesium causes 'spasticity' of back muscles, tight hamstrings, tenseness, muscle cramps.

Boron is a 'synergist' for calcium and magnesium, which means it helps calcium and magnesium to do their jobs. In the absence of boron, up to 40% of calcium and magnesium is lost in the urine. Boron is also commonly lacking in our soils.

Calcium, magnesium, boron along with copper, are high on the list of minerals necessary for proper bone formation and maintenance as well as joint health.

Spring time (worst time of the year for mineral imbalances) is when mares are in the third trimester of pregnancy, and are nurturing their growing newborn foals. (Increased requirements)

Lime is calcium, so liming is a good start and will take care of part of the daily calcium requirement. Magnesium is not so easily applied via the soil short term.

Our climate in New Zealand is changeable, warm and wet. The spring 'flush' is well known with its associated problems, but there are many slightly lesser 'flushes' throughout the year depending on conditions. Anytime the grass shoots away it grows too quickly to uptake minerals, especially magnesium.

There is a huge emphasis in New Zealand on grass production, and comparatively little on the health of the stock that are eating it. Many of the pastures our horses are grazing are primarily for sheep and cattle, and are more suitable for improving weight gain and milk production. Furthermore, they are fertilized with substances that promote rapid growth and therefore lack of mineral uptake.

Magnesium deficiency can cause many of the symptoms listed above in horses, including staggers. This is well recognized in cattle in the spring and remedied with magnesium supplementation. It is referred to as 'grass staggers' to differentiate it from 'rye-grass staggers' caused by the Lolitrem B endophyte in the rye-grass.

Magnesium is one of the most important minerals in the cell. Some is stored in the body, mainly in the heart and the skeleton, from where it is released when deficiencies occur in the diet.

Magnesium plays a vital role in the activation of around 350 enzymatic processes in the body including breakdown of blood glucose. Blood magnesium levels rise after the horse eats glucose or carbohydrates. Simplified : low magnesium = a reduced insulin response.

It therefore contributes significantly to the development of obesity, the 'diabetic' horse, associated laminitis and eventually to the "Cushings-like" syndrome.

Spring grass is especially high in glucose *and* low in minerals including magnesium.

Deficiencies affect the cell membranes of nerve and muscle tissue, leading to many of the above symptoms, especially the 'hypersensitivity' ones.

Magnesium is one of the essential electrolytes, along with calcium and potassium. Too much calcium and/or not enough magnesium can predispose a horse to 'tying up' (severe muscle cramps)

Symptoms include:

Excessive spookiness/alertness/excitability

Loss of appetite/poor condition

Nervousness

Exhaustion

Cramps

Cardiovascular irregularities

Epsom salts (magnesium sulfate) can be fed short term, however, regular feeding can lead to gastro-intestinal upsets, even diarrhea. Magnesium oxide is a form of magnesium that is usually applied to the soil. From there it would be processed thru the plant into a form that the body can utilize. It is imperative to feed a highly absorbable, organic form that is non-toxic and whatever the horse doesn't need will go out with the urine or manure.

**Magnesium needs to be part of the right feeding regime for your horse, according to his lifestyle.**

Kikuyu grass contains oxalates which bind up calcium. Horses grazing pastures with significant proportions of kikuyu definitely need to be supplemented with calcium. Feeding some lucerne along with a good calcium supplement is a good option.

Kikuyu grass is not high in nutrition, it is important to have a good feeding regime when kikuyu is prevalent in your pasture.

### **High Sugar = Lack of Fibre**

#### ***Insulin Resistance/Acidosis/Laminitis***

Grasses planted primarily to fatten livestock and promote milk production are 'high sugar' grasses. Hay made from wheat, barley, rye-grass or oats is high in sugar especially if it has been made prior to seed formation.

Sugar levels can be elevated in grasses when they are drought stressed or over-grazed. Sugar levels can sky-rocket in the spring when grass shoots away.

Grains, whilst they contain some protein, are mainly carbohydrate, and therefore oats, corn, wheat and barley contribute to total sugar the horse is consuming. So does any feed containing molasses.

When the input of feed far exceeds the output required for the amount of exercise the horse is doing, problems will ensue!!

What is happening in New Zealand is that we make the mistake of thinking that grass provides enough roughage and fibre. NOT TRUE! Young, green, growing grass is mainly non-structural carbo-hydrate (sugar and starch). Clover is 1/3<sup>rd</sup> higher in starch than grass. As the grass matures it develops more stalk and becomes more fibrous (as in roadside grass or standing hay). Then it is great as it is more fibre than sugar.

Horses have a small stomach and a short 'small intestine' (where carbs are digested). Then they have a HUGE hind-gut, (the caecum and large intestine), which takes up most of the room in the horses 'barrel'. The hind-gut is meant to be chokka full of micro-organisms which are designed to digest the large quantities of fibre the horse would normally eat. What happens instead is that the excess carbohydrate from the grass / molassed grains diet we force upon them, gets pushed into the hind-gut, where it cannot be digested. There it ferments, resulting in acidosis (low Ph) which kills all those good micro-organisms. The ensuing metabolic chaos, compounded by mineral imbalances especially the lack of magnesium, results in inflammation of the laminae of the hoof and there you have it, sore feet and laminitis.

In fact the horse/pony can eventually become *insulin resistant*, which is a similar condition to Type 2 Diabetes in humans.

Signs of insulin resistance include:

- being obsessed with eating, especially grass, you can't keep their head up!!
- 'lives on the smell of an oily rag', get fat easily
- has a 'cresty' neck
- gets 'pads' of fat behind the shoulders and above the tail
- puffiness, around the eyes and sheath
- urinates a lot
- lethargic
- mares don't cycle properly
- drinks a lot
- sore feet (pre-laminitic)
- prone to laminitis



It is important to understand that these horses are not just fat, they have a serious metabolic disorder that needs urgent action! They are like diabetic people and suffer from the dysfunction of every major organ system in their body, the circulatory system (especially to the hooves), the digestive system (especially the hind-gut), the reproductive system, the nervous system (including the brain), the endocrine system. They are an inch away from foundering.


Horse owners have reversed these symptoms by restricting grass intake, and feeding plenty of hay that has had the sugar content leached out by soaking in a tub of water for an hour before feeding. The water goes brown and fizzy. Tip it on your garden. Supplementation with chromium, magnesium and omega 3, attention to healthy hoof form and as much exercise as possible are equally important.

**PREVENTION IS WAY BETTER THAN CURE.**

**Please understand that it is primarily a hind-gut problem caused by sugar overload, lack of fibre and lack of exercise. These horses are the equivalent of the couch potato person who lives on junk food. The key to a healthy horse with healthy hooves is to look after the flora in the hind-gut by ensuring good fibre intake daily.**

**Fibre Requirements Relative to Lifestyle**  
(Adult Horses & Ponies)

Oils 5%	Oils 5%	Oils 5%	Oils 5%	Oils 5%
95%  Soaked Hay  FibaRich Pellets  <i>10% of this can be made up of Hay Cubes or Protein</i>	15%	Protein and (eg soya bean meal) 25%	and Carbohydrate (eg grasses, grains)	
	80%	70%	35%	45%
	FibaRich Pellets Hay Cubes Hay	FibaRich Pellets Hay Cubes Hay	60% FibaRich Pellets Hay Cubes Hay	50% FibaRich Pellets Hay Cubes Hay
<b>Obese &amp; or Laminitic</b>	<b>Idle</b>	<b>Light Work</b>	<b>Moderate Work</b>	<b>Intense Work</b>
<i>See below *</i>	<i>Less than 3 rides per week</i>	<i>Pleasure riding, dressage, Hacking, showing etc</i>	<i>Trekking, stockwork, showjumping</i>	<i>Racing, polo, endurance, hunting, eventing,</i>

 Fibre	 Protein & Carbohydrate	 Fat
---	--	---

Important:

- Soak hay in water for one hour (to reduce sugar content) discard water and feed immediately.
- Feed Hay without any perennial rye grass or clover in it.
- Feed Lucerne Hay, Lucerne Cubes or Lucerne/Timothy Cubes to Horses on Kikuyu grass for extra calcium.
- After approx 6-9 months the obese/laminitic horses' metabolism will be returning to normal and they can be fed as 'Idle' Be extremely diligent about not allowing a relapse.
- When on any kind of pasture feed a toxin binder containing mycosorb and a highly absorbable magnesium such as Alleviate.
- For horses in moderate to intense work add carbohydrate (eg grass & grain) and protein (eg soya bean meal, sunflower seeds, tick beans ) according to energy requirements (refer to table above).
- Avoid sugar overload in broodmares, young & growing horses, by ensuring a high fibre intake to offset high sugar content of lush pastures.

**Why Add Fibre?**

**Adding fibre to the diet of NZ pasture-fed horses is vital:**

- ✓ It keeps the hind-gut and its resident micro-organisms healthy, preventing sugar overload, which causes hind-gut acidosis (sloppy manure), ADD (attention deficit disorder), insulin resistance, metabolic chaos, laminitis.
- ✓ The digestion of fibre has immune-boosting, anti-allergic and hormone regulating effects.
- ✓ The fermentation of structural fibre is a major source of energy.
- ✓ Fibre helps synthesise B-Vits & Vit K for calmness and good health.
- ✓ Provides fuel for their internal body heater.

- ✓ Creates a water reservoir for proper hydration, especially after sweating, urinating and salivating.
- ✓ Requires more chewing = more saliva, preventing stomach ulcers.

### **Does your horse eat Grass? Clovers? Molassed feeds? Grains?**

Consumption of these, without sufficient accompanying fibre according to lifestyle **will** sooner or later result in a vast array of ill-health problems. Symptoms including many of those in the above list, "bad behaviours" (eg herd-bound, nappy), ravenous appetites, insulin resistance, obesity or ill-thrift, weak, sore feet and laminitis will become apparent.

***Green grass does not supply enough fibre in the diet of NZ pasture fed horses.***

#### **How Much Fibre?**

- ✓ A 500kg horse requires approximately 2% of his bodyweight per day. ie 10 kgs /day, 365 days/yr. Hay bales vary but this is approximately ½ bale.
- ✓ This can be achieved with a combination of hay, hay cubes, beet pulp.

NB. A 500kg horse is a large TB type hack. A Park Hack is more like 450kgs. Heavier hacks weigh more. Take empty float to a weigh station, then take horse in float to weigh station, this will give you an accurate weight.

If the horse is light in condition feed according to the weight he should be, not the weight he currently is.

If you want your horse to lose weight, soak the sugar out of the hay rather than cutting down his hay. Horses have a need to be eating and chewing 16-18 hours a day. Long periods without food cause mental stress and stomach ulcers.

#### **B-Vitamin Deficiency is Caused by a Lack of Fibre**

Within the large intestine of the horse, there should be a healthy population of 'good' bacteria, whose purpose it is to breakdown the food further, producing energy-rich, short-chain fatty acids. These bacteria also produce essential B-vitamins, vitamin C and biotin, necessary for just about every function in the body, including healthy red blood cells and optimal function of the nervous system.

Signs that a horse is not making sufficient of his own B vitamins are poor appetite, sour attitude, anemia, poor hooves and skin conditions.

**Biotin is one of this large group of vitamins. Everyone is busy supplementing with biotin to improve hooves when all the horse needs is more fibre in his diet so he can make his own. Hooves will not be strong and healthy on a sugar diet!!**

Anything that upsets digestion, such as a low roughage diet, (eg, spring-time sloppy manures caused by acidosis) or increased stress of any kind, will interfere with the horses ability to produce his own B vitamins.

It is a good idea to make sure your multi vitamin/mineral supplement has the full range of B-Vitamins. Mycosorb, the active ingredient of toxin-binders such as Tox-Defy and Equigard contains brewers yeast, which is great for B-Vitamins. Since they are water soluble and not stored in the body, you cannot overdose on them.

#### **Selenium**

Selenium is essential to good health in the horse. It is a trace mineral which helps to make important antioxidant enzymes that have several functions in the horse's metabolism. These selenium containing enzymes provide antioxidant protection in every cell of the horse's body. They also have roles that affect growth, immune function, muscle recovery and reproduction.

Many areas of New Zealand have soils deficient in selenium, which means unless you are supplementing with it, your horse is likely to be deficient. *Too little* selenium in the diet is a problem, it's a bit like trying to run a car without oil, causing degeneration of muscle tissue, stiffness of gait and a predisposition to 'tying up'. However, *too much* selenium is a problem as it is toxic to your horse. This has become more of a possibility since selenium is now added to a lot of feeds.

Annual blood tests are essential, so you know exactly how much to supplement with. It is best fed in small doses often, as in the organic forms available that you add to a daily feed.

For economic reasons, people with multiple horses often resort to the less absorbable, but cheaper, inorganic forms of selenium as in Selmit 1.

### **Photo-sensitivity..... (Sunburn & Mud Fever)**

Many horses with white faces and/ or white socks, suffer from 'sunburnt' noses, and/or chronic mud fever. Some get ulcers in their mouths.

The first line of thought with mud fever is that it is caused by "mud". The first line of thought with scabs on the nose is "sunburn". However, the truth is that it can be a very complex issue. So if your horse's mud fever doesn't clear up easily, it could be due to **Photosensitization**.

This is caused by eating plants which contain certain photodynamic pigments. These pigments enter the bloodstream and eventually reach the skin. When they reach the unpigmented skin of white faces and white socks, they are exposed to UV rays, they fluoresce, and thereby cause damage to the surrounding skin.

Affected skin rapidly becomes reddened, painful, and raised above areas of adjacent pigmented skin. Serum often oozes through the affected skin to form crusts in the hair. Soon, the dead skin becomes dry and parchment-like, and the hair and white skin slough leaving ulcerated areas that may develop secondary bacterial infections, especially in muddy conditions. Hence the name 'mud fever'. Yet the bacterial infection could be secondary to the real cause which is photosensitization.

When this occurs on the muzzle, it resembles, but is not, sunburn. It is a reaction caused by eating these plant pigments, which are exposed to UV rays in the vulnerable unpigmented skin areas.

Most commonly affected areas are the muzzles of horses with white faces and white socks as in mud-fever.

This explains why some horses that have 'heaps of white' never sunburn or get mud-fever, while others do so, chronically and exasperatingly!!

**Plants known to cause this kind of photosensitization include Perennial rye-grass, (you might have guessed!) clovers, especially white clover, alfalfa, lucerne, St John's wort and buttercup. Many horses are grazing pastures that comprise these species. Buttercups also contain a chemical that causes dermatitis from direct contact with it.**

Protection from UV rays is a huge help in prevention, however, this is tricky on the legs. There are vast numbers of topical applications for treating mud fever, which 'work', but often on some horses but not others. Quite often, just when you think you've got it beat, hey presto, it's back!! Understanding that there are a variety of causes, explains this frustrating scenario.

Preventing the horse eating the offending plants is obviously the best option but not always easy. It is yet another really good reason to work out ways to change your pastures to encourage other species than those listed above. See **Pasture... the Solution**

### **Head-Flicking/Shaking**

Now this is a difficult one. Something, the most likely candidate being a neuro-toxin, causes damage to the trigeminal nerve. This is a major facial nerve which goes from behind the eye down the face and branches out to the nostrils and mouth areas. Once it is damaged, increased blood supply, such as on exercise, triggers 'electrical' sensations down the nerve, causing the horse to incessantly flick his head. At first you are sure that a bug has flown up his nose. *Flick, flick, flick*, then suddenly, simultaneously, they put the brakes on and rub their nose on their lower leg. This is quite likely to happen while you are cantering along. It is so exasperating and believe me, nothing you do will prevent the behaviour.

Head-flicking can be triggered by any kind of 'pressure', (mental or emotional type pressure).

Large vet bills, many hours on the internet, trying nose-nets and UV masks follow. The latter provide temporary relief for some horses.

Over a period of a year or two, the bouts of head-flicking get worse and more frequent. They even become "photic", in other words triggered by sunlight and/or breezes. Not a sign of a flick on overcast days and unrideable on sunny days. One such horse that I know, could be ridden at night. Eventually the horse is exhibiting these behaviours while at rest in the pasture. It must drive them NUTS. It gets to the point where the horse is so distressed he is shoving his head in the hedge to get away from the light, and the owner reluctantly decides to euthanase him.

Personally, I am 100% convinced that the neuro-toxin comes from the rye-grass. And there has to be some connection between the UV sensitivity, as in the photosensitization, and the damage to the nerve. It will become clear eventually. Globally nobody knows exactly what causes it, but if you follow the gist of all this rye-grass stuff, you'll understand why the rye-grass has to be a strong candidate. I think the plants with the photodynamic pigments like rye, clover and lucerne act as 'triggers'.

From The Survey, 90% of the head-flicking horses were grazing rye/clover mixes, most on dairy or ex-dairy. (The other 10% did not know, but from the other symptoms their horses were exhibiting, they most likely were grazing pasture that contains rye-grass). Most were on rye-grass that has been fertilized with super, but some were on pasture that hasn't seen fertilizer for 10 years.

One quarter of the horses for whom their owners filled out an "Equine Health & Behaviour Survey" are head-flickers. (42 out of 170). I have heard of two horses whose head-flicking started after an accident that must have damaged the trigeminal nerve.

All the head-flicking horses from the Survey also exhibit other symptoms of myco-toxicity.

I know of several horses that flick when on rye-grass but cease to do so when taken off it.

The only two horses that I know of that have been completely removed from rye-grass/clover and are now grazing cocksfoot type pasture, are both virtually flick-free. One of these horses belongs to me.

Head-flicking does not seem to respond to a toxin-binder, even large doses. It can be seasonal, but the only hope seems to be complete removal from rye grass. Drastic measures such as blocking or cutting the nerve, give about 4-5 years of flick-free riding, but apart from the risk of a droopy lip, when the nerve repairs somewhat, it comes back worse than ever, and that is the end of it. There are some expensive drugs (cyproheptadine) that can help in some cases, but again not long term. It does seem ridiculous to go to such measures when maybe just removing the horse from the offending pasture could be the answer.

With my horse, even tho he is now basically flick-free, I am sure damage to the nerve still exists, as some flicking can still be triggered by increased exercise, as when I gallop him and get him warmer than normal, or if he gets his knickers in a twist about something (pressure).

Maybe the damage to the nerve will gradually repair completely, providing he is not exposed to the irritant again.

Certainly, whatever it is that causes it to become photic is gone. This could be to do with the fact he is no longer grazing the grasses that contain the pigments which cause photosensitization.

Please e-mail me with your story and anything you have found that helps.

\*\*\*\*\*