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We had a lovely old retired Clydedale cross city cart horse called Paddy on my parents' dairy and vegetable farm near Hillcrest, 20 km from Durban, South Africa. My younger brother and I sometimes rode him two up without saddle or reins. When he got tired of us he would run to a gateway that had a wire across the top to stop the stainer posts being pulled over by the fences. He had to lower his head to get under it, so we had to jump off. I'm sure he laughed to himself. Other than that, he was 100% docile. He used to be a bread baker's delivery cart horse in Durban, and knew the delivery route, stopping at stores to deliver and at red lights, and he would go again when green. So don't under-estimate the intelligence of horses.

Some say that horses can't be controlled with electric fences, and some say that valuable horses should not be fenced with electric fences. As shown here, these top quality horses in Holland proved them wrong. See Training below.

At Weston Agricultural College (Read Vaughan Leon Jones CV for more) there was a horse called Moir which means Wind, and for good reason. I rode him bare back, as many did. He took off, headed for a gate, which I thought he planned to jump, but at the last second he put all four anchors down and stopped like only a horse can, and things on wheels can't. I flew off and didn't get my anchors down in time, so landed on my bottom. My back was not the same for ages. I was stupid for riding him bare back.



My older brother, a motor mechanic, would not get on a horse. "Fit steering and brakes then I'll try," he would say.

This chapter is far from a complete thesis on horses, as those keen on horses usually know all the tricks and there are many books and plenty of Google information available about horses. The main messages in this chapter are about fencing, minerals, supplements, health and grazing.

Much of what is in GrazingInfo is from dairy, beef and sheep experiences, but the basics of horse health are included. Horses don't need cobalt, whereas cattle die if Co levels are too low. Horses don't need much selenium and can be ruined or die if too much selenium is in pastures from selenium having been applied instead of the safe Selcote Ultra slow release selenium, which some organic movements wrongly ban. Avoid fast release fertilisers, organic or other, because selenium chips, can sometimes be too much even for cattle, especially calves, so always fertilise with Selcote Ultra selenium chips for horses, and preferably for all animals. Read Selenium in Soils, Pastures & Animals in the Minerals section.

Horses are like pigs and Alpacas, in that they drop their manure in one place, and graze in another. If set stocked, horse manure areas increase in size and grow long grass that they don't eat, so is wasted, unless other animals are also grazed. If set stocked, horses will graze grasses they like to the ground, and possibly eliminate them. Daily moves prevent this. On a lifestyle property it may be necessary to subdivide it into many areas with a single electrified wire, and have some other animals.

Horses need to graze for about 15 hours a day because they have small stomachs, so don't use the ruminant grazing practise of filling them for the day in about three hours of grazing. Also have some good hay in a dry rain covered trough.

### Training

As with everything, horses need training to power fencing. Animals soon learn that high power electric fences are things to be avoided - provided they can see them. Some owners are not prepared to train their horses to power fencing and controlled grazing. Some say that electric fencing can't be used with horses so they try to justify their belief with all sorts of way-out statements. Meanwhile others, including Arab stud breeders like Art Snell of San Antonio, Texas, saved thousands of dollars by being one of the first in the USA to use high power fencing in the 1970s. To improve visibility, and to protect the horses and reduce breakthroughs, use wide white polytape as shown here, the benefits of which really show at night when most breakthroughs occur. Many times it is simply because some animals can't see the fence.

## Fencing

If you have valuable and/or agile horses you should build high, visible fences to a height of at least 2.5 m to discourage jumping. Use 12.5 gauge high tensile wire with close to 5,000 volts high energy (10 or more joules) and have an energiser that monitors the system and warns you of problems so if the voltage drops because a horse is entangled in a wire, you can turn the power off remotely and get there quickly to free it.



Also make sure that they are getting enough zinc to help their night vision. Read Elements > Zinc. Analysing the pasture minerals will tell you the level in your grasses. If low, it takes only 6 kg/ha of zinc sulphate to fix it at a cost of only about NZ\$18/ha.

Feeding a soluble mineral mix such as Solmin at 0.004% of their live weight in their drinking water can help. It contains the most salt and magnesium of others available. Many mixes have no salt which suits the vets because salt is the most health giving of all minerals. Read Salt.

Horses can be stressed and silly so run around like maniacs into fences and become entangled in wires, especially in new and small paddocks. To reduce this happening, use rails around the small paddocks and walk them along the fence lines of new paddocks that don't have rails before letting them loose. To help train them in power fencing, place an electrified offset wire or tape on both rail and conventional fences and always give horses time and space. High power fencing is so effective that if horses are behind a temporary fence for a week or so and the fence is then removed, they hesitate to go into the new area. Horses, if spooked, can even become entangled in non-electrified fences which have no warning system to alert owners. So always have wire cutting pliers handy to cut animals free and a remote fence controller to switch the energiser off from wherever you are. This is where high power fencing with an alarm excels. It can warn the owner of a failure in the fence, possibly caused by animal entanglement, anywhere within cell phone range. If the owner is hours away, he or she can phone someone to release the animal and fix the fence.

## Mob stocking horses

Intensive grazing in a mob makes horses trample much of their dung and spread it, and eat more weeds, so don't graze them too intensively and ensure that they can get feed every few hours. They can be grazed with cattle and/or sheep, but feed must then be limited or they can get too fat. Obese horses and ponies have decreased insulin sensitivity and reduced heat and exercise tolerance. A way of preventing obesity (apart from exercise) is to have them following other animals, but they may still need locking in a small area with access to water trough, using a live wire. Long wet pasture can cause rain rot on their legs and short, wet lush pasture can cause blisters around their muzzle and make them suffer colic and/or founder (similar to laminitis in cattle), especially if changed to it too quickly, or given too much.

As with ruminants, make feed changes gradually over ten days. High endophyte grasses can make horses very sick or can even kill them. Bealey NEA2 ryegrass has the least toxic endophyte, by a long ways, so all animals prefer it. If selenium is high, effects are worse. Too much selenium can adversely affect or even kill horses, so base all applications on ryegrass mineral analyses using Hill Lab. Also read Animal Health > Endophyte.

If selenium deficiency is suspected, horse owners should consult their veterinarians for confirmation by a blood test before attempting to supplement any, because many feeds, mineral blocks and supplements already contain selenium, and as you will have read above, the daily selenium intake recommended is a very small amount, especially for horses. Supplementing ruined some Auckland horses forever.

The Ohio State University Bulletin on horse nutrition wrote that while some (I would say very little - 0.1 ppm.) selenium is essential for horses for muscle and immune system functions, the mineral is a concern because of 'its narrow range between the requirement and toxic levels.' Too much selenium can be toxic to horses, causing mane and tail hair loss, lameness, hoof problems (including loss of the hoof wall) and, in the most severe cases, blindness and death. A veterinarian can determine if there is a selenium deficiency, and, if so, how best to create a safe and effective supplement program. Horses with selenium deficiency may sweat, have a rapid pulse, brown urine, limp and be stiff. High levels of endophyte in some grasses can cause some of these symptoms, so research the possible causes. Selenium reduces the ill effects of endophyte toxicity.

Slow release Selcote Ultra is less likely to cause such severe problems, but never exceed 1 kg of Selcote



Ultra slow release per hectare per annum which is the maximum allowed in New Zealand, or 0.5kg for horses, and avoid the fast release selenium chips for horses.

The College of Veterinary Medicine at Washington State University (WSU) reported cases of two horses with severe selenium deficiency, which, for both horses, resulted in death. Selenium-deficient horses can experience compromised immune systems or nutritional muscular dystrophy where the muscles break down. "When the heart is affected, the prognosis is very poor," they reported. Additionally, foals with selenium deficiency can be either weak at birth or normal at first, then unable to stand or nurse.

The reason foals may be affected is because the broodmare mare transfers selenium to the foal during pregnancy and then again through milk when the foal nurses, according to Ruth Bishop's 'Understanding Selenium' article in June 2005 Horse & Hound magazine. Bishop explained that horses usually need just 0.1 mg/kg selenium daily when inactive, then 0.3 mg/kg when in an exercise program or working as a broodmare.

0.3 mg/kg is the figure for cattle pasture, but about a third that for horses, partly because of other feed given to them. Horses have also been severely affected in New Zealand, by over supply, because our soils are selenium deficient.

Earthworms don't like the coarse fibrous parts of horse dung, so you may have to harrow or drag it with a spreader which can be made from vehicle tyres. Don't use tyned harrows that damage the pasture, pull out and tear up valuable grass, and are not necessary (except occasionally in under-grazed sod bound turfs). Old rubber tyres of the same size lying flat and tied together are cheap, and a V ring Cambridge roller-packer will also spread dung with minimum pasture damage, and make the paddock smoother if the soil is soft. If you don't have a roller, one made of same size rubber tyres clamped together in a frame will work fine.

Spreading lime over the dung areas will encourage earthworms, but firstly analyse the ryegrass to ensure that calcium is needed. See Pasture > Pasture Mineral Analysis. A soil analysis won't show it. Many things cange the pH. Read

### **Controlled grazing**

As can be seen in the photo below, these horses near Matamata in the Waikato have eaten some buttercup and other weeds. However, don't overdo it, because too much buttercup and some other weeds can be toxic. Some buttercups are worse than others. Correct liming reduces the growth of most weeds and makes some



more palatable so animals eat them. Read Minerals > Calcium and see the photos of our weed-free pastures on our two farms and the farms of many clients.

Correct liming, fertilising and controlled grazing reduces weeds. Make it your business to be able to recognise grasses, clovers and weeds.

Where a small number of mixed animals (cattle, horses, sheep, etc.) are being grazed on a small farm, all can be kept in one mob to reduce the number of paddocks required to achieve a grazing rotation. If horses are over-fed, there can be problems so be careful with this. Horses can be very bossy and chase or herd other animals for hours on end, even until the chased animals collapse and die. Most horses never do this, however some never stop and have to be fenced. It doesn't mean that none can be grazed with other animals, but avoid having small animals in with big problem horses, which may have to go into a small paddock of mostly grass.

Obesity increases the risk of laminitis and colic due to strangulation of the small intestine.

### **Ryegrass**

High production grasses are low in fibre and high in sugars and carbohydrates. Whenever the grass grows quickly, which is mainly in spring and after autumn rains, but also at many other times of the year in New Zealand's good climate for growing pasture, minerals become lower, mostly in magnesium. Fertilising with superphosphate, urea, and/or nitrogens, accelerate this growth further and cause plants to be shallow rooted and therefore less able to take up minerals from deeper in the soil. Superphosphate also lowers the pH, so acidifies the soil and pasture. Lime and its synergisms do the opposite, because they suppress the aluminium effect of causing shallow ryegrass rooting. Ryegrass roots won't go down through aluminium in soils. Correct LimePlus fixes it. Use the spreadsheets called Lime Nutrient Planner and Phosphorus Nutrient Planner. The 70 spreadsheets software are free. Get a pasture analysis (read Pasture Analysing) from Hill Laboratory and enter the information into the Pasture analysis spreadsheet, you will see how much of each to apply. Ask Hills to analyse the ryegrass as done by Vaughan Jones and to copy him. There is no extra cost, which is about \$140 plus GST by Hill Lab.

Letting ryegrass get longer before grazing reduces oxalate levels, but horses prefer short grasses, so confine them so they have to graze it all. See photo.

### **Paspalum**

This should be avoided because of its high mycotoxin levels and its highly toxic ergot that can form on its seed heads. Paspalum and ryegrass can both cause staggers.

### **Kikuyu**

Be very careful with horses grazing Kikuyu only because of its toxins and low feed value, especially its low calcium. Kikuyu grass contains oxalates which bind up calcium, so correct levels of Ca and its synergisms should be applied to increase levels and to grow more legumes, but horses don't like clovers, so growing lucerne or buying some and feeding it as hay helps horse health.

### **Big head in horses**

Clinical signs include weight loss, lameness, fracturing of long bones and swelling of the bones of the face and jaw; hence the term 'big head'. Perennial pastures and shrubs that can cause it include, buffells grass, setarias, panic grasses, kikuyu, signal grass, small leafed bluebush and saltbush.

If most of the calcium in plants is calcium oxalate, then horses will be at risk of developing calcium deficiency. This doesn't occur with ruminants, as their rumen bacteria breakdown the calcium oxalate, which releases the calcium for absorption.

As a result, pasture that may be excellent for ruminants can be dangerous for horses. Plants that have a calcium to total oxalate ratio less than 0.5 and more than 0.5% total oxalate content (DM) are considered hazardous.

Oxalates are produced by various types of fungi. Some of these fungi live inside the plant and are called endophytes. Perennial ryegrass, which is the predominant grass in New Zealand, contains endophytes which produce two very harmful mycotoxins, namely lolitrem B and ergovaline.

Make it your business to be able to recognise these grasses. When not in seed, the rye-grass is characterised by narrow, dark green, shiny leaves and red bases.

The lush rye-clover pastures seen on most NZ farms can be disastrous for horses and can cause digestive problems. Clover is 1/3 higher in sugar and starch than grass. All rye-grasses are already high in sugar, therefore even when they have had the endophytes removed as in low or zero-endophyte strains, they are still not suitable for horses.

### **High fibre for horses**

Horses thrive on a high fibre diet and so do better after ryegrasses brown off in the late summer when horses bloom and are quieter. The same occurs in winter when on more hay and grass that is not growing fast.

High sugar grasses, as promoted by some seed merchants for cows, can be detrimental to horses because they disrupt normal digestion, exacerbate certain medical conditions, and lead to serious complications like colic and laminitis, a double whammy that can strike a horse. Some ryegrasses are promoted as 'having high sugars' to benefit cows, but all ryegrasses are high in sugars.

Read Jenny Paterson's <http://www.horsemanshipnz.com> and <http://www.horsemanshipnz.com/articles/Aspects%20of%20Pasture.pdf> but don't be too disheartened because Kikuyu can be controlled. Two sprayings with Grazon and Codacide kills Kikuyu and not ryegrass. Read about it in Gardens. There is more information in Google under 'Kikuyu horses grasses'.

If you have Kikuyu, encourage other grasses, but not ryegrasses or Paspalum for horses.

Fungi love acidic conditions. Pastures fertilised with acid fertilisers such as superphosphate encourage them. The best reactive phosphate now is Sechura imported by Asura Ltd, Box 65-317, Mairangi Bay, Auckland. Matt Webby <matthewwebby@yahoo.co.uk> 021-331-620

The best reactive phosphate with low heavy metals grow much better quality pastures and improve the soils more than superphosphate does. LimePlus is also usually necessary, but seldom promoted by consultants and agents. Read Mineral > Calcium, Boron and Serpentine.

I am the only one who gets farmers and laboratories to ryegrass analyse and base the fertiliser required aiming for close to 0.9% Ca in ryegrass stems and leaves. Of the 500 farms I've done, only 5 (1%) had enough calcium. Fertiliser companies tell lies about calcium to reduce its sales which takes money that would be spent on fertilisers.

Google for: Which grass is best for horses & what to avoid

## Health

New Zealand's climate, and the generally low pH soils, means the conditions are frequently very favourable to fungal spores and mycotoxins. If you live near orchards you will know how often they spray for fungi. You will have seen moulds suddenly appear on horse manure from time to time. Fungi love acidic conditions, so pasture fertilised with traditional superphosphate makes an ideal environment for them. The lifestyle of the typical Kiwi horse means they spend most of the time out grazing the pasture. Consequently they are inevitably ingesting and inhaling vast numbers of fungal spores and myco-toxins. Not just at certain times of the year, but any time the conditions favour fungi! It is no surprise that the results of the "Equine Health & Behaviour Survey" fit with this information. The horses with the most, and severest symptoms, are invariably grazing the 'improved' pastures, especially the rye/clover mixes. Of these, most are also being fertilised with superphosphate which makes soils acidic, which releases heavy metals, most of which are toxic. Applying a LimePlus mix, based on your ryegrass analysis, figures for which are on the left of the spreadsheet called 'Ryegrass Analysis', helps make the soil neutral.

However, there are some horses with severe symptoms that live on rye-grass pasture that hasn't been fertilised in 10 years, and others that graze 'low-endophyte' pasture and still show symptoms. Thousands of horses throughout New Zealand suffer for many months of the year, from an array of the symptoms listed below. All the 'severe' cases have exasperated owners who have spent many hundreds, sometimes thousands, of dollars investigating other possible causes. They have had numerous blood-tests (which time after time come up clean), equine practitioners of all descriptions, multiple saddle fittings and sometimes up to three new saddles, horse dentists and hoof trimmers. Finally they hear about feeding a toxin-binder. Google for Toxin-Binders.

## Facial Eczema

Horses don't usually show Facial Eczema symptoms, but sporidesmin can damage their livers so use the LimePlus procedure in the Animal Health > Facial Eczema chapter to control it in horse paddocks.

## Hay

Bad, mouldy silage, balage or hay can cause animal sicknesses and death. Mould in haylage killed about 100 horses in Florida, USA in 2008. See Silage > Mould.

Leaving dead pasture in any form (toppings, uneaten hay or silage) to decay on the ground creates a wonderful environment for mould and fungi.

When soils have adequate calcium, boron, magnesium (and all minerals at correct levels) they are less



likely to foster moulds and fungi, and earthworms will thrive and eat the dead vegetation, turning it into casts and humus, before a problem occurs.

## **Supplements**

Some horses are very valuable, so products and feeding systems have been developed specifically for them. A good vet (many are not good) and good feed store should know about these. Not all advice is good, though, so be careful and get proven consultants. Herbal products have been developed for horses, however, check them before buying, and speak with several actual users before using any yourself. If you don't, you could end up with a disaster, such as all your horses ruined for life, as happened when excess fast release selenium chips were applied to all pastures on a small farm by an alternative-type fertiliser company. If calculating supplements by weight per horse, use 500 kg which is an average weight of a normal farm riding horse.

In April, the equine world was shocked when 21 elite polo ponies at a Florida championship polo match died within minutes of each other. [www.horsetalk.co.nz/news/2010/04/047.shtml](http://www.horsetalk.co.nz/news/2010/04/047.shtml)

The law suit sort more than US \$4 million. It alleges the pharmacy used too much selenium.

There have been many other disasters, so be careful. Due to the widespread coverage of the tragedy, horse owners may wonder about the role of selenium in horses and the safety of compounded mixes. Too little of an element is better than too much. Warn your staff and keep toxic elements locked up with a key in YOUR pocket.

Selenium also works in conjunction with vitamin E. Depending on work load, horses require about 0.1 ppm in their pasture, whereas ruminants need 0.3 ppm. Avoid the organic selenium chips which are fast release so increase selenium levels up to 0.7 briefly, which is even too much for ruminants. Apply only Selcote Ultra slow release at no more than 0.5 kg per hectare for horses, but only where a ryegrass analysis shows it is low. Ruminants need 1 kg per hectare. Horses can get enough selenium from weedy pastures in areas not too low in it, but in high rainfall acid areas this can be impossible without fertilising with it at no more than 0.5 kg per hectare of slow release Selcote Ultra, no other and no more often than once a year. If the policy is to feed selenium with supplements, then fertilising with it should not be done.

The supplementation rate for selenium in deficient areas is generally about half that of cattle. Read Elements > Selenium. Some alternative products sold as fertilisers are just sand, dust, clay, etc.

## **Fertilisers and so called fertilisers**

There are many fertilisers on the market so study them and use only the basic ones that have the minerals that are deficient, shown on your Pasture Leaf Analysis, not all sorts of things in minute amounts of parts per million (ppm) that are in most subsoils that chisel ploughing can bring up for a fraction the cost and without the weeds I've seen growing after some Abron fertilisers were spread. Probitas, which I and others have tried, are found to be expensive and wanting. I've been on the Probitas developers' farm and several that have used Probitas, and none showed any advantage over correct fertilising with the basic items, including serpentine, the main element of Probitas. See Elements > Magnesium.

My equal costs comparative trials showed Probitas to be inferior to Lime Nutrient Planner and Phosphorus Nutrient Planner, because its main beneficial ingredient is the magnesium in serpentine, which is in both Nutrient Planners more cheaply. The developer of Probitas admitted to me that serpentine was the main beneficial ingredient. Serpentine costs about NZ \$240/tonne. The Probitas company has several agents, so it depends on how accurate each is at calculating the lime and proper fertiliser requirements. I've been told that some have made serious mistakes adversely affecting the health of stud racing horses, in particular.

As with all fertilisers, enter the analysis into Fertiliser Values spreadsheet to compare yours with the exact optimums and use Calcium and Fertiliser Nutrient Planner spreadsheets for your orders.

## **Kaimanawa wild horses**

These in the poor central North Island low organic matter pumice soils, thrive on dead dry grasses (not high moisture perennial ryegrass or Kikuyu) with no cobalt and no selenium. Horses breed well and have to be reduced in numbers. The authorities should kill all the males and replace them with a few good race horse stallions. In a few years the horses will become valuable to sell.

## **Foundering**

This occurs mostly in horses that are allowed to over-eat. As with humans, over-eating strains and kills.

Reduce the lush pasture by less fertilising, grazing it when longer and sowing coarser less palatable grasses such as prairie grass, cocksfoot (*Dactylis glomerata*), velvet grass (Yorkshire fog) (*Holcus lanatus*) timothy, and the older wild grasses such as browntop and crested dog's tail. Note that the tall grasses won't last with the over-grazing that uncontrolled horses do by repeatedly grazing the same areas, so this should be stopped by rotating them, because high nitrates is bad for horses. Also avoid high potassium pastures, but simply get pasture mineral levels correct. Grazing horses after cattle reduces the possibility of them foundering, because they eat the left-overs around the cattle manure.

Don't leave horses in the paddock for too many days or they'll eat the high nitrate regrowth. Adequate magnesium has been shown to reduce foundering. See > Pasture Analysis for optimum levels and fertilise accordingly with serpentine, the best source of steady release magnesium. When feed exceeds what is being used in energy, horses can founder.

### **White line disease**

This is a misnomer because it is not a disease. Stretched white lines and deep grooves fill with rotting material, causing hooves that won't hold a shoe, soles that remain flat in spite of the most diligent care, and recurring abscesses. Cracked hooves are more likely to suffer from it. The initial stages of infection do not cause lameness, but by the time the horse is lame it has done a tremendous amount of damage. Early signs include a hollow sound when the hoof is tapped with a hammer, a dished or bulge shape in the hoof, tender soles, heat and a white line that is soft and chalky. Affected horses can lose a shoe and a chunk of hoof with it.

A veterinarian and farrier should work together to determine the best course of treatment. X-rays may be necessary to determine the extent of the damage to the inner hoof wall as well as to the coffin bone. If the farrier needs to perform therapeutic shoeing, he will also need access to those x-rays. Keep the area clean and dry.

### **Allergies**

There have been reports of photosensitivity in horses consuming hay containing clover infested with *Cymodothea trifoli* fungus, which causes Black Blotch or Sooty Blotch on clover and alfalfa. I wonder if low phosphate increases it, because low phosphate causes black spots right through clover and lucerne leaves.

Aran clover is high in hydrocyanic acid. It is banned in Switzerland because it made horses sick. If you have horses and buy clover seed, warn the seed vendor to not put any Aran clover seed in your mixes, which some will do (and some have done) if they don't have the clover variety ordered. See Pastures > Clovers. Avoid feeding too much clover to horses.

High endophyte grasses cause some horses to suffer much more than cattle, while other horses are not affected. Endophytes vary widely on their affect on different horses and more than on other animals). AR37 is the worst by far, AR1 less so, while Trojan NEA2 and Bealey NEA2 are hardly a problem. As at this date, Trojan NEA2, a diploid, is far ahead of the other New Zealand perennial ryegrasses in survival and palatability because of the high palatability of NEA2 endophyte. It has the same north west Spanish origin as Bealey (a tetraploid), but being a diploid, has finer leaves and is denser so should survive longer. Remember that ryegrass survival is dependant on adequate calcium in particular, to suppress aluminium which ryegrass roots won't go down through, so they then suffer droughts more and shallow rooting, which means grazing can pull them out. Some in New Zealand are now sowing the Welsh perennial ryegrasses, but developed in the colder Wales, means their winter yield in New Zealand is lower. See > Grasses.

### **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, the increased blood supply, such as when exercising, 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', i.e. 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 only 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 euthanise 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 photosensitisation, 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 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 fertilised with superphosphate, but some were on pasture that hasn't seen fertiliser for 10 years.

All the head-flicking horses from the Survey also exhibited 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 and other grasses, are both flick-free. One of these horses belongs to the writer. 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 though 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 (emotional or mental pressure). Maybe the damage to the nerve will gradually repair, providing the horse is not exposed to the irritant again.

## **Foaling**

The foaling process is different to that of cattle. Foals at birth normally lie for a few minutes with their back legs in the mare, and the umbilical cord attached. They start breathing and gain strength while still fed from the mother. It is important to avoid upsetting foaling at this stage. Never cut the umbilical cord because it is thought the foal receives blood from the placenta after birth. After it breaks, the stump should be dipped in a mild, 1 to 2 percent iodine solution. The iodine dries the umbilical stump and prevents bacteria from traveling up the stump and entering the foal's body. Bacteria entering the foal through the umbilical stump can cause a systemic infection known by various names, such as shigellosis, naval ill, joint ill, or polyarthritis which can cause a severe illness or death or a swelling and deformity in the foal's joints.

Most membranes clear off the foal's nose, but if they don't it is important to gently break and clear them. If foals don't get oxygen soon after birth they can be adversely affected and show this by being weak, slow to move and then wander around as if lost.

A normal, healthy foal lifts its head and neck and rolls onto its chest within several seconds after delivery. Then the foal begins to make creeping movements away from its dam. If the mare has not stood up, the foal's movements usually break the naval (umbilical) cord. Foals with circulatory problems typically seem dumb and may have convulsions, leading to the common terms of "dummy" or "wanderer" foals for this condition.

If the foal doesn't drink within three hours of birth it should be helped to get at least a litre of colostrum. Keep frozen colostrum in store for emergencies. Check the mare for mastitis. Check that the foal passes dung within a few hours of birth. If not it may need more milk or a vet. Ensure both are on clean spelled pasture and not with other horses or animals. Make regular inspections of them.

Examine the naval stump for several days after birth to make sure that it remains dry. Urine dripping from the stump indicates that the foetal urine passage from the bladder to the umbilical (the urachus) has not closed. Normally the urachus closes at birth. If it fails to close, in a condition called 'persistent urachus' the foal should be treated by a veterinarian.

Inject the foal against tetanus on the day of birth and if necessary, give an antibiotic.

Usually, foals stand within 1 hour of birth. During the first standing attempts, the foal will be unsteady and constantly shifting its head, neck, and feet in an attempt to remain balanced. This unsteadiness is normal, and you should let the foal stand by itself. Don't lift the foal onto its feet. Doing so before its legs are strong



enough to support it may strain tendons and ligaments, and it interferes with the bonding process between the mare and foal.

Austrian researchers found that inserting microchips caused less stress in foals than branding.

### **Keep left**

Always work on the left side of foals and horses. A study showed that foals preferred to be handled on their left side. Those handled on their right side at birth can more often tend to avoid contact with humans or not like handling at all, than those handled on their left side.

### **Minerals**

If a good soluble mineral mix is supplied through the drinking water, horses on pasture improve in condition, colour, sheen and bloom. A sleek coat sheds rain and reduces problems such as hair rain-rot. A horse breeder wrote that there are no “nutty” horses, just ones lacking important minerals. He points out that low magnesium can cause stress in horses, so as with cattle, analyse your pasture and fertilise accordingly.

If your horse has laboured, or noisy breathing, (symptoms similar to asthma), then it is possibly suffering from constriction of the airways. Magnesium is a natural dilator, so keeping magnesium levels right through the soil so in the pasture, and in High Magnesium Solmin should give them enough. Horses don't drink as much as cows, so need more High Magnesium Solmin in their water.

Serpentine is the best fertiliser form of magnesium to apply to soils. See Elements > Magnesium and Pastures and Fertilisers. There is ample evidence that salt (37% sodium and 60% chloride) is essential for soil and animal health. It is an essential element for digestion and cellular uptake of glucose and amino acids, and nerve transmission.

### **Salt Deficiency**

Horses are most likely to develop signs of salt (NaCl) deficiency when worked hard in hot weather. Sweat and urinary losses are appreciable. Horses deprived of salt tire easily, stop sweating, and exhibit muscle spasms if exercised strenuously. Hemoconcentration and acidosis may be expected. Anorexia and pica may be evident in chronic deprivation, although these are not specific signs of salt deficiency. In lactating mares, milk production seriously declines. Polyuria and polydipsia secondary to renal medullary washout may be seen in prolonged deficits.

Sodium controls muscle contraction and plays a part in nerve impulse transmission and the rhythmic action of the heart and the efficient absorption of amino acids from the small intestine requires adequate sodium. Salt is important in almost every cell of an animal's body, regulating blood, digestive and excretion processes. Salt helps maintain a constant body temperature minimising winter cold stress and summer heat stress.

Some people, when in heat or exercising excessively and lacking sodium, can feel faint and even bilious. Some athletes lacking sodium (and/or magnesium) have collapsed. Tropical pastures are sodium deficient, unless near the coast, or in very low rainfall areas so chronic salt deficiency occurs especially in soils that are low in sodium, tropical grasses and in high rainfall areas. When concentrates are fed, salt and other deficient minerals should be included.

There are many reasons why supplying salt (and trace elements) in the drinking water through an on-line all plastic dispenser are beneficial.

When horses exercise they generate heat and rely on sweating to cool their body temperature. The provision of potable water is essential, but sweat includes electrolytes - sodium, chloride, potassium, calcium, magnesium and others we may not know about. Also the soluble mineral mix is like an electrolyte and TMR because it mixes with the feed in the rumen.

People have been wrongly convinced that salt must be kept to a minimum for human health, whereas really it should be kept at optimum levels, especially if exercising a lot, but not if one is fat and sits around lot. There is also a difference between table salt, which in excess can sit in joints, and natural mineral salt. All horses, and especially ones exercised, need salt. A horse in training in cool conditions should get about 50 grams of salt a day and in summer double that depending on the amount in the feed. Pasture on the coast where winds come off the sea can have 0.2% Na, while in the middle of New Zealand and the continents only 0.01%. Recent research has shown that the voluntary intake of salt by horses in work is highly variable. The study showed that the sodium (Na) intake of 4 out of 6 horses was well below even the maintenance requirement. It must be provided in the feed or drinking water. See Elements > Salt.

### Surplus horses

Apparently, in USA, horses are not allowed to be slaughtered and have their meat sold. The result is that because owners can't afford to keep them, horses are either sent live to Mexico or Canada to be slaughtered, or let loose to roam wild in USA. Some graziers care for old horses, with some of them grazing hundreds and getting paid to do so.

Rather than having horses starving or suffering in old age, they could reduce the cost of meat for pets. Many dogs owners don't know that wheat is completely unnatural for their pets and that many dogs are gluten intolerant, so suffer (as do the owners) from foul smelling wind and motions - from their dogs! See Human Health > Gluten. Low-cost meat could provide a much better diet for dogs than one containing gluten.

### Tip

Don't try to stop stampeding horses. Trying has killed people.

### Driftwood put to use

These beautiful, trouble-free horses were made from driftwood. Google for 'Driftwood Horses'.



Vaughan Jones, ONZM Queen's Honour in 2013, for services to farming. 99% dairying honours in 1948. NZ Dairy Board winner for Most Improved Dairy Farm in Waikato 1959. International Agricultural Consultant & Journalist. Represented New Zealand at Agricultural Journalist Congresses in USA in 1992 & Austria in 1994. Managing Director of GrazingInfo.com website since 1970, now with 520 members. NZ M.Mkt.I founder and chair. Doubled sales and exports, for many companies.