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KER - Science Based Nutrition

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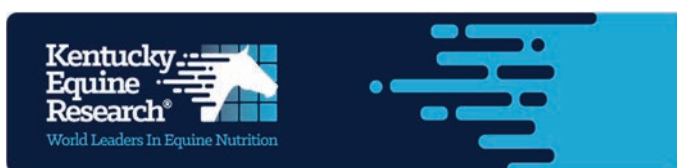
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This issue features a couple of new offerings from Kentucky Equine Research (KER).



Kentucky Equine Research was founded in 1988 when Joe Pagan, Ph.D., realized that information generated from research was not disseminated to the individuals who needed it most: feed manufacturers and horse owners. Since the company began, filling that void has been a priority.

Applying the results of its research trials, KER continually develops solutions to the health and nutritional challenges inherent in the management of the modern equine worldwide, including unique nutritional supplements, exclusive feed ingredients, and partner feeds.



KER has the laboratory capabilities, trained research horses, and experienced staff necessary to develop innovative products.

Protocols can be designed and carried out to test the effect of a particular product, substance, or proposed feed ingredient on a range of equine physiologic systems.

Blood tests, muscle biopsies, and precise exercise-related measurements can be conducted according to a customized plan.

The facility features a high-speed equine treadmill with indirect calorimeter, six-horse walker, full laboratory, and other equipment to perform a battery of tests.

KER studies flavour preference, feed forms, ingredient processing, and ingredient metabolism, as well as routine in vivo quality control studies to ensure all KER-affiliated feed ingredients and supple-

ments are free from prohibited substances.

The Kentucky Equine Research farm encompasses 150 acres and is home to around 40 trained research horses.

In 2017, Kentucky Equine Research further expanded its research facilities to include a dedicated Thoroughbred training center in Ocala, Florida.

The new training facility, called the Kentucky Equine Research Performance Center, enables researchers to observe the influence of nutritional changes in active racehorses in a typical training environment.

Neigh - LOX and Triacton are the latest well researched products in the pipeline from the providers of standouts like the outstandingly successful DrinkUp (boy was that ever needed at this year's Horse of the Year!) and the hind gut antacid Equishure.



Special points of interest:

- * 2 new products in the equine range from science based company KER
- * If horses are not your thing there are the jokes



An Alternative to Omeprazole



The horse's stomach is a relatively small organ with a capacity of less than 15 litres. This limited size is well suited to processing a continuous supply of forage, such as when the horse is grazing. For domesticated horses therefore the recommendation is that rather than offering one large meal, split daily feeds into two or more small meals of less than 2.5 kg each.

However long periods with nothing to eat can cause problems because the stomach continues to secrete gastric acid even when it is empty. This means that gastrointestinal upsets are common among horses.

It is well known that horses are prone to gastric ulceration and many wrongly attribute this to stress in highly strung performance animals when, in fact, the major cause is this physical effect of continued gastric acid secretion into an empty stomach.

Common symptoms include gastric sensitivity, windsucking, weight loss, stable vices and decreased performance.

Until now most treatments involve omeprazole therapy, as a proton pump inhibitor, but Neigh - LOX brings a different approach. Rather than simply reduce acid production Neigh-LOX is scientifically formu-

lated to maintain normal digestive function in horses at risk of stomach damage. Neigh-LOX is also designed to protect the digestive tract against excess gastric acid and provide a physical protective lining in the stomach and small intestine.

This is done by using a scientifically formulated blend of antacids and gastric agents for horses at risk of gastric irritation and damage. Neigh - LOX not only contains slow and rapid-acting antacids to effectively support the maintenance of a normal gastric environment but also contains coating agents designed to protect the sensitive lining of the stomach.

This is a major point of difference from omeprazole.

The analogy in human medicine would be the difference between Losec tablets and something like the highly popular Gaviscon, which contains antacids and also protective coating agents.

While both treatments are effective, the antacids and coating agents provide instant relief.

In addition there are not only problems with long term use of proton pump inhibitors, such as omeprazole, but also there can be a marked increase in gastric acid secretion, a bounce back effect, upon cessation of therapy.

In humans long term use of proton pump inhibitors has been associated with increased risk of bone fractures, hypomagnesaemia, vitamin B12 deficiency, acute interstitial nephritis, increased risk of C. difficile diarrhoea, increased risk of pneumonia and drug interactions via the cytochrome P450 system (Vine et al).

Cessation of therapy has shown gastric acid suppression for one

week then a rebound with return of symptoms (Waldum et al).

Neigh Lox contains aluminium based antacids and has been used extensively in a number of countries over the last 20 or so years.

The use of the product has never been linked with elevated TCO₂ and no one has investigated the effect on plasma TCO₂. As the antacids have a local effect there would not be any effect expected on plasma TCO₂.

Neigh-LOX dose (4 oz) has 240 mEq of acid-neutralizing capacity, which is equivalent to the amount of gastric acid typically produced over a six-hour period.

"This is a major point of difference from omeprazole."

In addition to its buffering capabilities, Neigh-LOX also contains compounds that coat the lining of the stomach and adhere to gastric lesions, which maintains healthy mucosa and supports healing.

The supportive effects of Neigh-LOX in young horses were reported in a study conducted by researchers at the University of Bristol in England. Thirty-four foals were enrolled in the study and underwent endoscopic examination of the stomach to determine the severity of gastric ulceration.

The study commenced, with 16 foals given a control diet and 18 given the control diet and Neigh-LOX. At the end of the study, gastroscopy revealed the majority of foals that received Neigh-LOX improved, while the majority of those on the control diet worsened (Nicol et al, 2002).

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An Alternative to Omeprazole

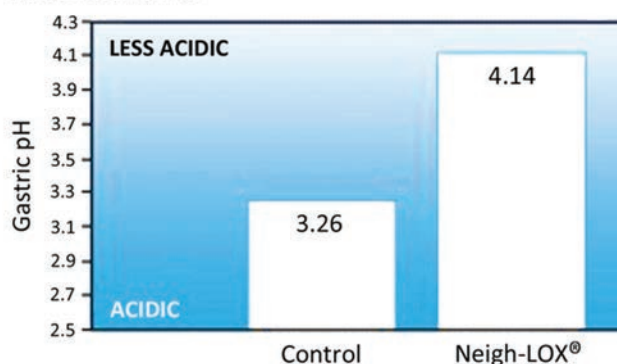
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In another study, this one conducted at Auburn University, researchers measured the effect of Neigh-Lox on gastric pH of mature horses. For three weeks half of the horses served as controls and consumed a diet consisting of Bermuda grass pasture, ryegrass hay, and a 10% crude protein pelleted concentrate. The other horses were fed the same diet and Neigh-Lox.

Following the three-week period, gastric fluid samples were collected using a nasogastric tube, and the pH of the fluid was determined using a digital pH meter. The diagram shows that Neigh-Lox was effective in raising the pH of the stomach and maintaining an environment that is not conducive to ulcer formation (Garcia et al, 2005).

So, in summary, when compared to omeprazole Neigh-Lox is every bit as effective in reducing gastric upsets, does not have long term side effects, there is no rebound on cessation, it does not affect plasma TCO₂ and, most importantly, is much more economic to use.

Figure 1. Gastric pH following Neigh-LOX supplementation. When Horses consumed Neigh-LOX, gastric pH raised from acidic raised from an acidic 3.26 to a more neutral 4.14



55g in each feed can be fed as a maintenance dose during low-stress periods. For horses in work, during show/sale or competition preparation feed 110g each hard feed but do not exceed a total daily intake of 220g.

A 2.26kg container provides a 20 day supply and the 11.36kg provides a 103 day supply

References:

Garcia et al, 2005. The effect of oral antacid on gastric pH and cribbing frequency in the horse. In: Proc. Equine Sci. Soc. 19:214.

Nicol et al, 2002. Study of crib-biting and gastric inflammation and ulceration in young horses. Vet. Rec. 151(22): 658-662.

Niklasson et al Dyspeptic Symptom Development After Discontinuation of a Proton Pump Inhibitor: A Double-Blind Placebo-Controlled Trial Am J Gastroenterology 2010; 105:1531-1537

Reimer et al, Proton-Pump Inhibitor Therapy Induces Acid-Related Symptoms in Healthy Volunteers After Withdrawal of Therapy Gastroenterology 2009; 137:80-87

Vine et al, Proton pump inhibitors: how to withdraw treatment, Prescriber 19 September 2012

Waldum et al, Marked increase in gastric acid secretory capacity after omeprazole treatment, Gut 1996; 39: 649-653



Buddy

An out-of-towner drove his car into a ditch in a desolated area. Luckily, a local farmer came to help with his big strong horse named Buddy.

He hitched Buddy up to the car and yelled, "Pull, Nellie, pull!"

Buddy didn't move. Then the farmer hollered, "Pull, Buster, pull!" Buddy didn't respond.

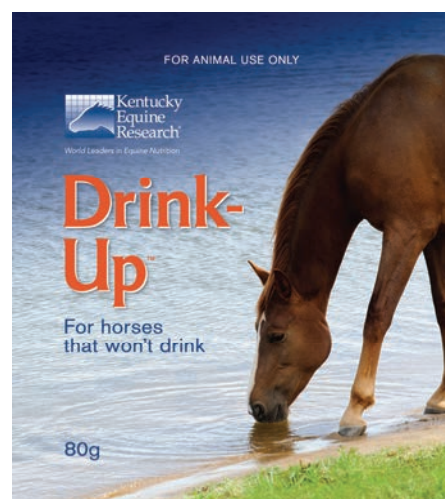
Once more the farmer commanded, "Pull, Coco, pull!" Nothing. Then the farmer nonchalantly said, "Pull, Buddy, pull!"

Then the horse easily dragged the car out of the ditch.

The motorist was most appreciative and very curious.

He asked the farmer why he called his horse by the wrong name three times.

"Well... Poor old Buddy is blind and, if he thought that there was no other horse there and he was the only one pulling, he wouldn't even try!"



Bone Density in Horses

Bone quality is important for the long-term health and soundness of performance horses. Many horses begin athletic careers before they reach maturity and bone maturity is just 17% at birth, 76% at 1 year and does not reach full maturity until the horse is 6yo. This means that serious stress is placed on immature bones and joints.



Equine bone is not static, it is constantly remodelling and, like other tissue, it is a case of use it or lose it. As little as 10 days box rest leads to a considerable reduction in bone mineral density. It takes 16-20 weeks for horse to adapt bone to galloping.

Maximising bone density is important for maintaining bone strength and preventing injury. Shin soreness is a condition of the third metacarpal bone which is related to bone fatigue and/or stress fractures. Problems such as shin soreness are common in horses without a steady increase in workload to adapt. Horses with shin soreness have a lower bone density compared to sound horses.

It is generally a case of too much work too soon but, if a horse is not

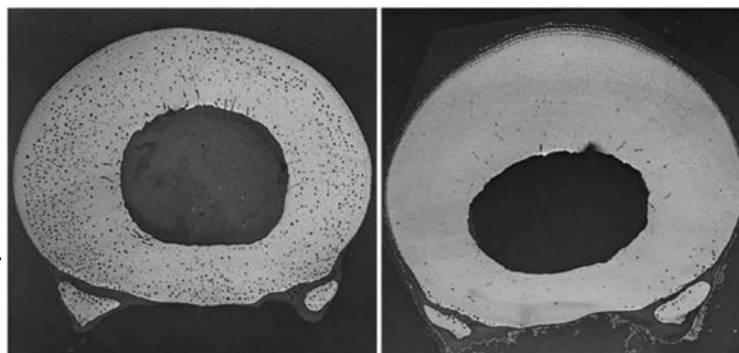
getting correct nutrition, regardless of training, it cannot build strong bone. The first signs of the problem are heat and swelling over

the dorsal aspect of the cannon bone.

KER studied the relationship between shin soreness, blood parameters and cannon bone measurements in 30 2yos as they were prepared for ready to run sales in late winter/early spring. 5 of the 30 horses became shin sore. The shin sore horses had lower bone density.

In a specific KER bone density research trial, based in Ocala, Florida from December 2016 to March 2017, thoroughbred race horses in training were used. The test group were fed Triacton™ with a placebo fed control group for comparison.

Bone density and bone mineral content were used to measure skeletal growth with radiographic photodensitometry being used to estimate bone density. Bone morphology was measured by bone width and bone area.



Over the 90-day training period, the horses supplemented with Triacton™ had significantly greater increases in both dorsal and palmar cortical bone density compared to the horses that received the placebo ($p < .05$). Specifically, horses receiving 120 grams of Triacton™ per day had a threefold greater increase in bone density in the dorsal cortex (shin) of the cannon bone compared to a placebo.

Increasing bone density in young horses with Triacton™ supports skeletal soundness and helps stave off damages caused by intense training programs, which may include bucked shins.

Triacton™ is a pelleted, palatable supplement designed to be fed twice a day. Triacton™ contains KER BMC™ (Buffered Mineral Complex), which is a unique form of calcium from marine sources.

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The President's Bodyguard.

Donald Trump is walking out of the White House and heading toward his limo, when a possible assassin steps forward and aims a gun

A secret service agent, new on the job, shouts 'Mickey Mouse!' This startles the would-be assassin and he is quickly captured.

Later, the secret service agent's supervisor takes him aside and asks, 'What in the hell made you shout Mickey Mouse?'

Blushing, the agent replies, 'I got nervous. I meant to shout 'Donald, duck!'

Bone Density in Horses

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BMC™ is more bioavailable than other commonly supplemented calcium including calcium carbonate

New research at KER has shown horses on omeprazole have reduced

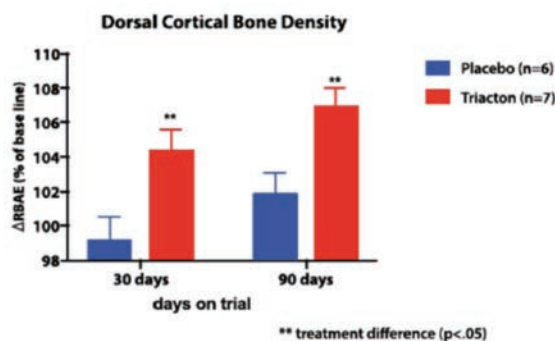
absorption of calcium from their diet.

Calcium is a vital substrate for bone growth and it is important to supplement these horses with a

bioavailable source of calcium.

This makes Triacton™ ideal for horses undergoing ulcer treatment

If a horse is being treated with omeprazole the recommendation is to not actually stop the treatment, but be aware of the increased calcium requirement and recommend Triacton™ for horses on the medication.



Young horses in training, those on omeprazole, those in stable confinement and horses on high oxalate pastures are all targets for Triacton™ therapy.

The Hind Gut

As well as gastric ulcers many horses also suffer from hind gut acidosis. Many of the warning signs for colonic ulcers are similar to those signifying possible gastric ulcers

Diarrhoea, intermittent or acute, and recurrent mild colic episodes signal a clear hindgut problem, and absolutely warrant further investigation to determine if colonic ulcers are present.

Close to 90% of racehorses have gastric ulceration, over 60% have hindgut acidosis and more than 50% can have both. The problems may have

remarkably similar signs but treatment is different.

Traditionally omeprazole, and now Neigh - LOX, are used to control gastric pH but they are less effective on the hindgut.

The solution there, also from KER, is Equishure which contains encapsulated bicarbonate that is not absorbed in the stomach or small intestine but survives to be effective in the caecum and colon, controlling pH and associated problems in that region.



Trial of Strength

The strong young man at the construction site was bragging that he could outdo anyone in a feat of strength.

He made a special case of making fun of one of the older workmen.

After several minutes, the older worker had had enough.

"Why don't you put your money where your mouth is," he said.

"I will bet a week's wages that I can haul something in a wheelbarrow over to that outbuilding that you won't be able to wheel back."

"You're on, old man," the braggart replied. "Let's see what you got."

The old man reached out and grabbed the wheelbarrow by the handles.

Then, nodding to the young man, he said, "All right young fellow. Get in."

ARVP Conference

Each year the association of veterinary clubs around the country, known as ARVP (Association of Rural Veterinary Practitioners), have their own conference, attended by head vets, CEOs of clubs and board members. The 2018 edition was held by the Northland association and held recently in the Bay of Islands. Ethical Agents was a gold sponsor and also sponsored the dinner.



The occasion began on a Sunday night, with a formal Maori welcome at Waitangi followed by a hangi. While the weather was fine at this stage tropical cyclone Gita was heading south and looking to disrupt proceedings.

Therefore the proposed Hole in The Rock boat trip for the Monday afternoon was cancelled and was replaced by a wine tasting tour. Monday duly arrived and what the media were now calling ex-tropical cyclone Gita was lambasting several parts of the country.

The far North however was really only on the fringes so was lambasted by heavy rain all day.

There were several good speakers through the day, the key note ones having strong Northland connections, with the two high profile standouts being Lockwood Smith and Lance O'Sullivan (the doctor not the jockey).

Lockwood Smith is an ex Speaker of the House and recent High Commissioner to London. Raised in Ruawai he studied agriculture at

Massey, had a high profile TV role as a quiz-master, which he described as not a career but simply a job to help fund masterate and PhD studies, before becoming a lecturer at Massey and later a National MP and cabinet minister.

He spoke of times in parliament and his talk was non-partisan as he praised some Labour initiatives and criticized some of National's failings, in particular the mess left by the Muldoon administration.

He exuded pride upon seeing little old New Zealand holding pride of place atop the Legatum Index, a prosperity index of 149 countries around the world, in 2016. We did slip to second behind Norway, those pesky Vikings, in 2017 but were well ahead of our main trade rivals around the world; Australia in 2017, for example, was in 9th place.

Lockwood showed up as a true politician when asked at question time

to talk about the various prime ministers he served under; he spent some time talking without ever addressing the question at all.

Lance O'Sullivan was also an enthralling speaker. He told of his early life, being part Maori part Pakeha, having a heavy drinking violent father and struggling at school. After being expelled at high

"showed up as a true politician when asked at question time"

school in Auckland he was eventually sent south to Timaru, staying with an aunt and uncle and looking to turn his life around. He was however expelled again and sent back to Auckland. He finally found his niche as a boarder at Hato Petera College and went on to study medicine, becoming a GP in the Far North and a strong voice for the down trodden of his area.

He was New Zealander of the year 2014 for bringing health programmes to disadvantaged in rural areas and, in the same year, he was also named the second most trusted New Zealander (after Willie Apiata).

He has now stopped being a general practitioner and is immersed in other programmes, taking on the anti-vaccinators and also the casinos by linking poker machines with child poverty. He has started a health programme on line, in particular using Soul Machines an Auckland-based company that develops intelligent, emotionally responsive avatars that improve the user experience on artificial intelligence platforms. Basically it is adding emotions into the interface between humans and computers.

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ARVP Conference

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Lance O'Sullivan's programme, MAiHEALTH, involves health 'deputies' in pop up clinics around the country being able to assess people's symptoms and cardinal signs and send them, including video shots electronically to Kataia and recommendations, approved by a medical practitioner can be made.

So rather than seeing a doctor face to face, patients will instead sit in front of two iPads and a TV where they can talk directly to a doctor

based in Kaitaia, He showed one instance with a video of a child in distress and the whole process, from the deputy uploading the information to the medical recommendation was 8 minutes, all at minimal cost.

He is also now planning a career in politics, knowing full well that will lose him his spot as 2nd most trusted New Zealander.

Altogether it was a stimulating talk, only let down right at the end when he made comments about the profligate use of antibiotics by vet-

erinarians. He needs to read the paper showing that NZ veterinary use of antibiotics is the 3rd lowest in the world, behind only Iceland and Norway (pipped again by those Vikings!!)

On the final day there was a North versus South Island waka race scheduled but, to the chagrin of many, this was cancelled due to the weather.

So, while the weather gods did not play their part it was, overall, a very enjoyable weekend; despite Greg's speeding ticket in Kamo!

A Rare Dish

The restaurant boasted that it could provide any dish, no matter how alien or rare. If the chef could not produce the dish then an alternative meal was on the house.

Consequently they did good business with smart alics ordering filleted bee's knees marinated in port sauce, or roast goanna tail in curry, surrounded by Tibetan cabbage on rice.

However one evening the order was for braised elephant's kidneys on toast.

A simple demand but as 10 minutes stretched out to 20 the chef finally came out to apologise.

Due to an earlier order on crocodile knuckle sandwiches they were completely out of bread.



Asleep on the Train

When he boarded the train he explained that he was tired and asked the conductor if he could be put off at Junction Town.

"Don't worry if I swear a lot," said the passenger, "I am a notorious grump when I am woken up."

"No worries," said the conductor.

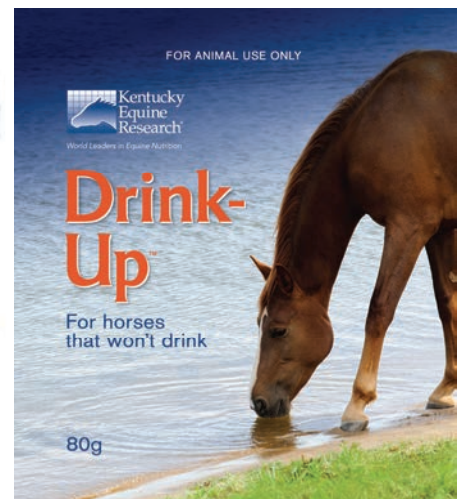
It was dark when the train stopped and the conductor finally gave the passenger a shake.

"What the hell is this?" roared the passenger, realizing that he was at the terminus.

"I told you to wake me at Junction Town you god forsaken son a no good b%\$#@#"

The conductor listened to a long string of abuse and finally muttered, "Yes, you can swear a lot, but not half as much as the bloke we put off at Junction Town!"





Sleeping Arrangements

A rabbi, a Hindu and a lawyer were driving late at night in the country when their car broke down. They set out to find help and came to a farmhouse.

When they knocked at the door, the farmer explained that he had only two beds, and one of the three had to sleep in the barn with the animals.

The three quickly agreed. The rabbi said he would sleep in the barn and let the other two have the beds.

Ten minutes after the rabbi left, there was a knock on the bedroom door.

The rabbi entered exclaiming, "I can't sleep in the barn; there is a

pig in there. It's against my religion to sleep in the same room with a pig!"

The Hindu said he would sleep in the barn, as he had no religious problem with pigs.

However, about five minutes later, the Hindu burst through the bedroom door saying, "There's a cow in the barn! I can't sleep in the same room as a cow! It's against my religion!"

The lawyer, anxious to get to sleep, said he'd go to the barn, as he had no problem sleeping with animals.

In two minutes, the bedroom door burst open again, and in came the pig and the cow.

