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Equine MATTERS

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Inside this issue:

Dealing with difficult and dangerous horses

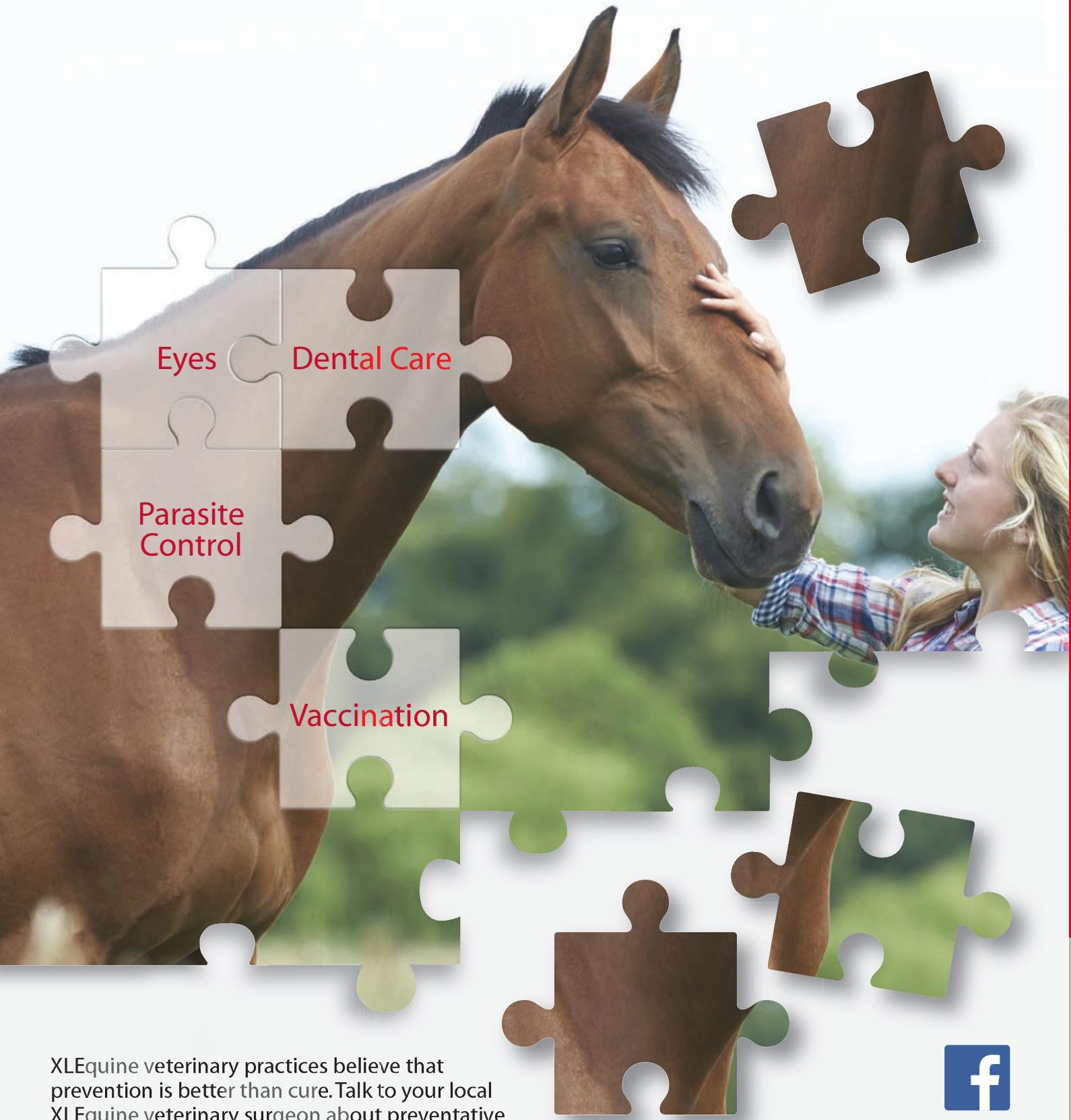
We explain how we can safely provide veterinary care

Advanced imaging modalities

Find out more about diagnostic imaging options in horses



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FROM THE EDITORS

Welcome to the 'Spring 2016' issue of Equine Matters...

...produced by XLEquine practices.

2016 has brought some exciting changes for Equine Matters with two new editors on board! We thank Lee Pritchard for all his excellent work over the past two years, and we are looking forward to the challenge ahead.

We are bringing some new features to Equine Matters - Ask the Expert, The Hot Potato, Happy Endings, 'Send us a Selfie'



Imogen Burrows

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XLEquine and your veterinary practice - what does it mean?

Within the veterinary profession there are traditional privately owned practices and others that are part of a larger corporate group. XLEquine practices fall into the first category and as we are owned and run by vets, any decisions that are made come with a sound ethical and clinical backing from the vets on the ground that are treating your horses.

XLEquine is the equine specialist division of XLvets which, founded in 2005, is a unique group of veterinary practices which span the length and breadth of the country, from Penzance to Orkney. Our member practices range from large equine referral hospitals to mixed veterinary practices with an equine component, incorporating over 100 equine vets. Our aim is to work collaboratively and cooperatively to share resources, learning and clinical skills to deliver a high level of customer care and equine welfare.

Whilst, like any business there is a need to generate profit, the drive for this is to

reinvest in the facilities, equipment and staff who are there to give your equine friends the very best. A quality veterinary practice will always be progressive in exploring new ways to deliver excellent care to you as horse owners.

As a horse owner this gives reassurance that if your horse, pony or donkey is treated by a practice carrying the XLEquine brand, you will have the personal approach that you have come to expect from your local independent veterinary practice, but the backing of one of the most respected groups of vets in the country - and the only collaborative group of its kind.

XLEquine practices work together to share knowledge and skills, to ensure together we are equipped to keep your horses well and healthy. XLEquine vets very much focus on helping you keep your horses fit, not just treating them when they are ill.

There are many ways you can get involved with XLEquine including our healthcare campaigns such as 'Keep one step ahead' and our practical vet-led EquineSkills training workshops - visit www.xlequine.co.uk for more information.

XLEquine provides a quality assurance mark for excellent equine care. We are proud to be associated with XLEquine and hope that you will feel proud of your practice too.

“ I am very grateful for the collaborative yet skilled approach you take, and the sensitive way in which you deal with the difficult dilemmas we all face as horse owners. ”

C Hopkins Kingston



www.xlequine.co.uk



Jenny Fanning BVetMed, Cert AVP (EM), MRCVS, Rosevean Veterinary Practice



Veterinary surgeon Jenny Fanning

XLEquine practice Rosevean Vets Practice



Figure 1. Profuse bleeding from both nostrils is considered an emergency

Nosebleeds in the horse

Nosebleeds in horses can be from a number of different causes, ranging from very minor to severe and life threatening, so knowing the difference could save your horse's life!

If your horse ever has a nosebleed then there are some important points to note:

- when did the nosebleed occur?
- have there been any previous episodes of nosebleeds?
- was it a trickle or running?
- how long did the bleeding last?
- was the bleeding from one or both nostrils?
- what colour was the blood? e.g. bright red, dark red or black/brown
- is there any history of trauma to the head?
- did the bleeding occur after exercise?
- has the horse done any recent travelling, especially long distance?
- has there been any other nasal discharge?
- has there been any recent respiratory tract infection?
- is there any coughing?

The answers to these questions can help narrow down the cause of bleeding.

Profuse, bright red blood from one or both nostrils is considered an emergency (figure 1). However, in many cases bleeding is mild (figure 2) and is not witnessed, or will be suspected if blood is seen around the muzzle or on the front legs; or will have stopped by the time the vet arrives.



Figure 2. Trickle of blood from the left nostril

Causes of nosebleeds in horses include:

- head trauma
- fungal infection of the guttural pouch (mycosis)
- ethmoidal haematoma
- exercise-induced pulmonary haemorrhage
- neoplasia (tumours)
- foreign bodies
- clotting/bleeding disorders
- pneumonia/lung abscess
- sinusitis

Diagnosing the cause of nosebleeds is usually quite straightforward, beginning with a thorough clinical examination and often includes endoscopy. Endoscopy involves a small flexible camera being passed into the horse's nostril to visualise the upper and lower respiratory tract and allows samples to be taken from the guttural pouches, trachea and even deeper down in the lung lobes. This is usually done under sedation or with the aid of a twitch (figure 3).



Figure 3. A horse being endoscoped. The image on the monitor is of the mainstem bronchi

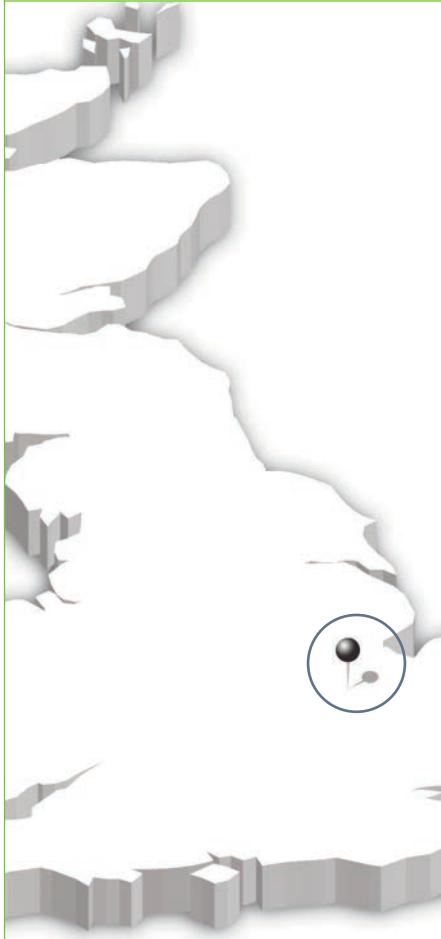
If no diagnosis can be drawn from these examinations, then further techniques that may be used are: radiography of the head, and less routinely the chest; blood sampling to assess clotting function; sinoscopy, where a flexible camera is placed into the sinuses; computer tomography (CT) or magnetic resonance imaging (MRI).

Treatment depends entirely on the cause of the bleeding. Many of the causes of nosebleeds can be treated effectively, some with conservative care and medication, others with minor or major surgery. Unfortunately a few causes have no treatment and will eventually prove to be fatal. In summary, nosebleeds are reasonably common in horses and mild, recurrent cases often go unnoticed without problems. However, if you do notice that your horse has nosebleeds, we would always recommend consultation with your vet to ensure prompt diagnosis and appropriate treatment.



Fellowes Farm Equine Clinic Ltd

VETERINARY SURGEONS



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Advanced imaging modalities explained

Investigations of many illnesses or injuries in horses, in particular lameness issues, will utilise a variety of methods of imaging. Traditionally this has been limited to radiographs (x-rays) for bones and joints, and ultrasound for soft tissues such as tendons or ligaments. These remain common practice in equine veterinary medicine, but where they fail to produce the answers or detail we need to allow accurate diagnosis to be made, alternative approaches are required. Over the past 15 years this requirement has been filled by nuclear scintigraphy (bone scanning), magnetic resonance imaging (MRI) and computed tomography (CT).

Modality	Bone Scan	CT	MRI
Area of body possible to image	Entire body	Head, neck, legs from elbow and stifle downwards	Lower legs from top of cannon bone downwards
Standing or anaesthetised?	Standing	Standing or anaesthetised	Standing or anaesthetised
Tissue under investigation	Bones and joints	Mainly bones and joints but can give some information on tendons and ligaments	All tissues



Nuclear scintigraphy

Nuclear scintigraphy or bone scanning is most commonly used in the investigation of under performing horses where the cause of the problem is not clear and a general approach is required, or when multiple limbs are affected. Often horses are not obviously lame, rather just lacking propulsion or disuniting at canter. A radioactive phosphate molecule is injected into the horse's bloodstream which binds to the bones of the skeleton. Any areas of the skeleton which are damaged will bind more of the molecule than normal and will be visible when images are taken with a gamma camera. The entire skeleton can be examined in a single session (taking about two hours) with the horse under standing sedation. Bone scanning is particularly important for diagnosis of back and pelvis injuries (figures 1 and 2), but is also useful for head, neck and leg issues. Once the problem area is identified, further imaging such as radiography will likely be required to characterise the exact nature of the injury.

Magnetic resonance imaging

MRI gives an extremely detailed three

dimensional view of all types of tissues, but can only examine small areas at a time. Most machines are currently only large enough to allow imaging from the top of the cannon downwards, and examination is limited to a single area at a time, e.g. the fetlock (figure 3). The area to be examined is placed inside a powerful magnet and radio waves are applied. The signal produced varies according to different tissue characteristics, allowing a computer to create an image of the horse's leg in which all the different tissues can be clearly identified and analysed for any abnormalities. MRI is indicated when the location of a cause of lameness has to be regionalised, usually with nerve blocks, but conventional imaging modalities have not identified the problem. It is most commonly used to examine horses' front feet (figure 4) and has significantly improved our understanding and management of foot pain.

Computed Tomography

CT is essentially a three dimensional radiograph. The area to be examined is placed inside a helical x-ray generator and images are taken in a circular fashion.

Using a computer, a 3D image can then be developed which provides detailed information of the position and density of adjacent tissues and avoids the superimposition of tissues which plagues standard 2D radiographs. CT is most commonly performed in standing horses to examine the head for dental or sinus disease, or the neck for causes of incoordination (Wobbler's Syndrome). CT is also used in anaesthetised patients to examine the legs, allowing appreciation of complex fractures prior to reconstructive surgery, or in combination with a contrast agent to look at soft tissue disease. In some cases it is now possible to get a horse's stifle into a CT machine to investigate the joint cartilages and cruciate ligaments.

As in human medicine, diagnostic imaging for equine patients is advancing rapidly. Machines are becoming larger and more powerful every year, allowing more areas of the horse to be examined and more detailed images to be produced. Perhaps the days of a 'whole horse scan' are not that far away.

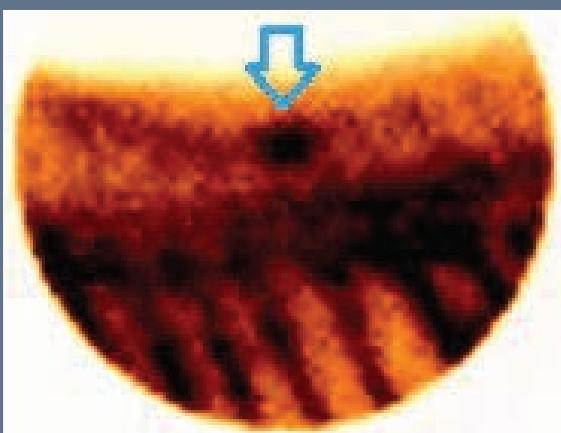


Figure 1. Bone scan of the back. Nuclear scintigraphy image of the left side of a horse's back. A clear 'hot spot' is seen at the centre of the back, directly under the weight of the rider. This is indicative of 'kissing spines' (blue arrow).

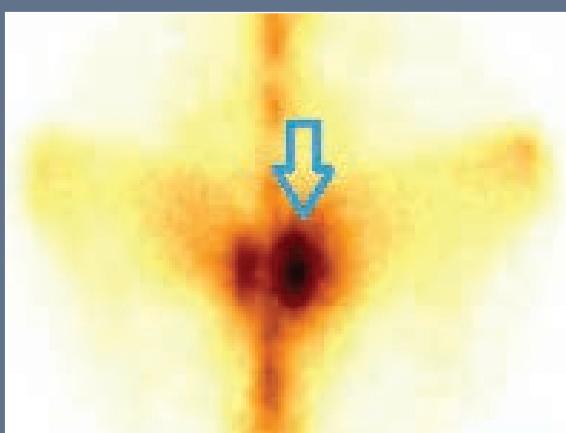


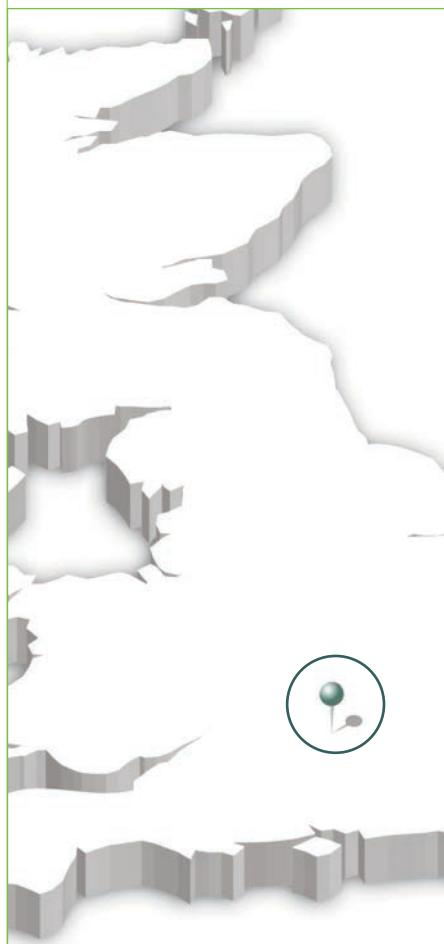
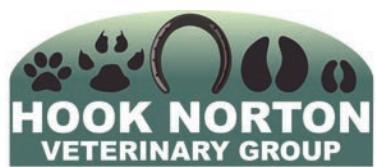
Figure 2. Bone scan of the pelvis. Nuclear scintigraphy image of a horse's pelvis from above. There is much more uptake of the radioactive 'dye' in the right sacroiliac region when compared with the left (blue arrow), indicating right sided sacroiliac disease.



Figure 3. MRI fetlock. MRI image of a normal horse's fetlock joint taken parallel to ground level. Excellent detail of bone density, cartilage thickness and tendon integrity can all be seen on the same image.



Figure 4. MRI Foot. MRI image of a horse's foot taken parallel to ground level. A tear can be seen in the deep digital flexor tendon (see blue arrow above). This injury is not visible on radiographs and due to the structure of the hoof, cannot be easily identified by ultrasound examination.



Veterinary surgeon

Thomas Righton

XLEquine practice

Hook Norton
Veterinary Group

Thomas Righton, BVSc MRCVS, Hook Norton Veterinary Group

Dealing with difficult and dangerous horses

Anyone who works with horses will have come across a difficult or dangerous horse. Such horses are at best a source of stress and anxiety for owners and at worst a safety concern for all involved.

Horses may display difficult or dangerous behaviour for a variety of reasons. Fear caused by new experiences, lack of handling and previous bad experiences may be the underlying reason. Horses are a prey species, with a profoundly strong "flight" response in the face of perceived harm or danger. Such horses will often display behaviour such as running to the back of the stable, turning away from the handler, or trying to bolt out of partially open doors. This behaviour may become increasingly aggressive if their initial flight response is unsuccessful and they cannot escape their perceived danger, e.g. being confined in a trailer.

A smaller proportion of horses are genuinely badly mannered or dangerous to handle. Often these horses are well mannered during everyday handling; but become stubborn or aggressive when asked to do something they do not want to do. Owners may try to avoid situations which may upset the horse, rather than work with the horse to train them to tolerate different experiences.

There are different approaches to dealing with difficult horses, in many cases training

and patience will yield good results. In all cases it is important to create a calm quiet environment; horses are very sensitive to their surroundings and a large number of noisy people crowding around a horse feed into its prey instincts eliciting a flight response. Try to have only as many people as required present and keep noise levels down. Admittedly, this can be difficult when owners are stressed or worried. Horses that are frightened or nervous require a more gentle patient approach, whereas the more badly mannered horse needs a firm, experienced handler.

Distraction techniques using food can be useful in some cases and aim to create a positive association with whatever is being done to the horse. The timing of the reward is important and needs to be given promptly after the desired behaviour is displayed. I find this approach more helpful in frightened horses; the badly mannered group are often habitualised to being treated and therefore will not respond as well to food. Nervous horses, e.g. poorly handled youngstock, often respond well to grooming and feed as a distraction (**figure 1**).



Figure 1. Grooming the itchy areas of a yearling helps to distract her

In some circumstances, difficult horses need handling or treating immediately. In these cases a variety of techniques can be employed to give short term control over a difficult horse to ensure it can be dealt with or treated safely. For horses which barge, using a bridle or chiffney bit to hold them, rather than a head collar, can give the handler additional control.

The correct use of a nose twitch is a useful technique for safely restraining horses for short periods of time, such as injecting a needle shy horse. A nose twitch is usually a short piece of rope placed around the upper lip of the horse and held in place by a pole. It is thought that a nose twitch initially causes some discomfort and leads to distraction in the first couple of minutes; however after a few minutes some horses start to appear more relaxed and calm. Studies have shown that a nose twitch stimulates the release of endorphins which have painkilling properties. When using a twitch it is important to leave it on for a couple of minutes to get this effect. Results can be quite variable between horses, with some showing a marked sedative-like response.

Skin twitches can also be employed to give short term restraint; this involves taking a handful of skin just in front of the shoulder and holding it tightly. I believe it only serves to offer a quick mild distraction, but can be useful in distracting a difficult horse long enough to give a quick injection, e.g. vaccinations.

Chemical restraint now plays a big role in modern veterinary practice allowing vets to carry out a wide variety of diagnostic and therapeutic procedures safely in standing

horses. Sedatives are usually administered via an intravenous injection which requires the horse to be still enough to allow accurate injection of the drug (**figure 2**). In some horses one of the above techniques may need to be employed to allow safe injection. Alternatively, the horse may be sedated orally or by injection into the muscle. These techniques may be sufficient to then carry out the necessary task, or

allow safe intravenous injection subsequently.

It is important to remember that a sedated horse is not rendered "safe"; they may still react suddenly and can be less predictable despite looking completely docile moments before. Handlers should never forget this and always wear appropriate safety equipment, e.g. hat and gloves (**figure 3**), and position themselves accordingly.



Figure 2. Extension sets added to an intravenous catheter and secured to the skin provide the ability to inject the horse safely from a distance



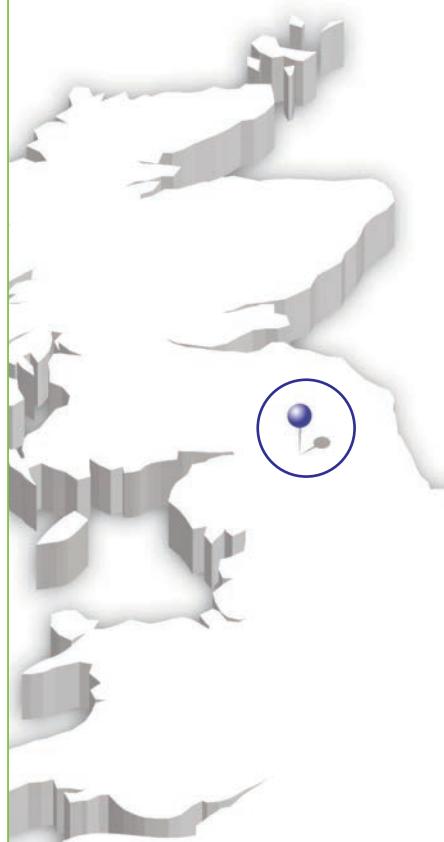
Figure 3. A nurse holding a sedated patient, wearing a hat, gloves and suitable footwear

Tips for needle shy horses

- Try to habituate your horse to having their neck rubbed in the region a vaccination would be administered.
- Begin introducing soft pinches of the skin in this area and reward good behaviour with a small treat or verbal praise. Continue this until the horse no longer reacts.
- Gradually increase the intensity of the pinches, or use a ballpoint pen pressed against the neck to represent a needle and syringe. Continue to reward good behaviour.
- Take it slowly and try this little and often; the aim is to habituate the horse, which may take some time, so be patient.
- When your horse accepts this from you, introduce someone else doing the same technique.

**Scott
&
Mitchell
Associates**

VETERINARY
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Tetanus

Introduction

Tetanus, or "lockjaw" is a highly fatal infectious disease of all species caused by the toxin of the bacterium *Clostridium tetani* (**figure 1**). There is considerable variation among animal species in susceptibility to the disease, with horses being the most susceptible.

Horses, ponies, mares, geldings, stallions and foals are all at risk. There does not appear to be any age predisposition.

The causal bacteria are commonly present in the faeces of animals, especially horses, and

in the soil contaminated by these faeces. The bacteria can survive in the soil for many years. The factors which aid survival in the soil are unknown.

The disease is not contagious, meaning it is not spread from horse to horse. Infection of the horse occurs through a penetrating injury, usually to the foot or lower limbs (**figure 2**). Clinical signs develop as the toxin affects the nervous system and most cases are fatal.

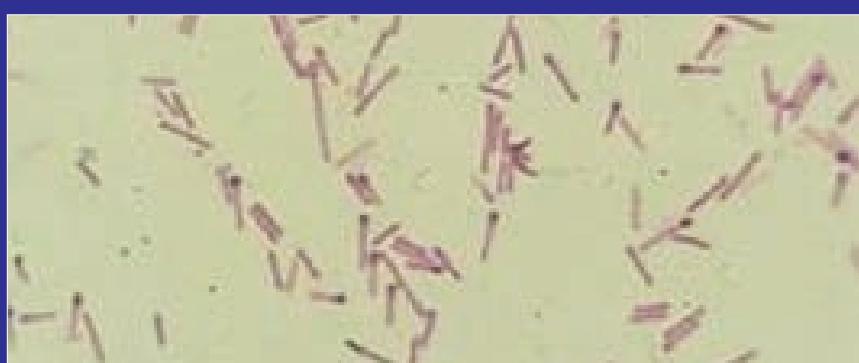


Figure 1. Tetanus bacteria



Figure 2. Horses can become infected with tetanus via wounds

Clinical signs

Signs will develop between one and three weeks following exposure to the bacteria, though in most cases of disease, the initial penetrating injury is never found. The entry site is usually through deep puncture wounds, but the spores may lie dormant in the tissues for some time and produce clinical illness only when tissue conditions favour their proliferation.

The affected individual will initially become nervous and extremely sensitive to external stimuli. A stiff gait and muscle spasm will then be evident. The third eyelid will protrude across the eye (**figure 3**) and the tail head may be held constantly in a raised position.



Figure 3. The third eyelid can be seen protruding from the inside corner across the eye

As the condition progresses, the neck, jaw and throat muscles will spasm, leading to difficulties in eating and drinking (**figure 4**). It is these signs that have led to the name "lockjaw".

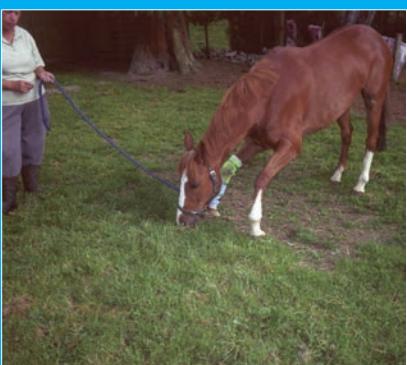


Figure 4. Spasming of the front leg muscles makes grazing very difficult

In the late stages of the disease, the horse will be recumbent and may have seizure before death occurs due to paralysis of the breathing muscles.

Treatment

This includes sedatives, antibiotics and large doses of tetanus antitoxin although is usually

futile. Critically, all cases must be kept in a quiet, non-stimulating environment and need intensive nursing care. Most cases are not noticed in the early stages and once "lockjaw" is present, the horse will need to be destroyed on welfare grounds (**figure 5**).



Figure 5. A collapsed horse in the end stages of the tetanus. This animal requires euthanasia on humane grounds

The success of treatment is very poor. In my 20 year career, I have seen four cases of tetanus and all have needed to be humanely destroyed.

Prevention

A highly effective vaccine, given by intramuscular injection, is available. The primary course is two injections given approximately one month apart. Most vaccination manufacturers recommend an initial booster is given a year later. Booster vaccinations are then required every two or three years, depending on the vaccination used.

Tetanus vaccination is usually combined with influenza vaccines, though they can be given separately if influenza vaccination is not required.

Vaccination of mares four to six weeks prior to foaling will provide protection for the mare. If the foal subsequently receives an adequate supply of colostrum, the foal will be passively immunised for the first ten weeks of life.

Key points

- Prevention is highly effective; treatment is not.
- A vaccine is readily available, relatively inexpensive and very effective.
- There is no medical reason why a horse should not be protected from tetanus through vaccination.

What age can I begin to vaccinate my foal?

Depending on the exact vaccine used, foals can usually start their vaccination programme from five to six months of age.

What should I do if I find a wound on my unvaccinated horse?

Clean the wound with water and possibly diluted skin disinfectant, e.g. chlorhexidine gluconate 4% (HiBiScrub, Molnlycke Health Care Ltd.) and then call your vet.

Tetanus antitoxin can be administered to the unvaccinated horse and this can give passive protection (emergency vaccination) against tetanus for three weeks.

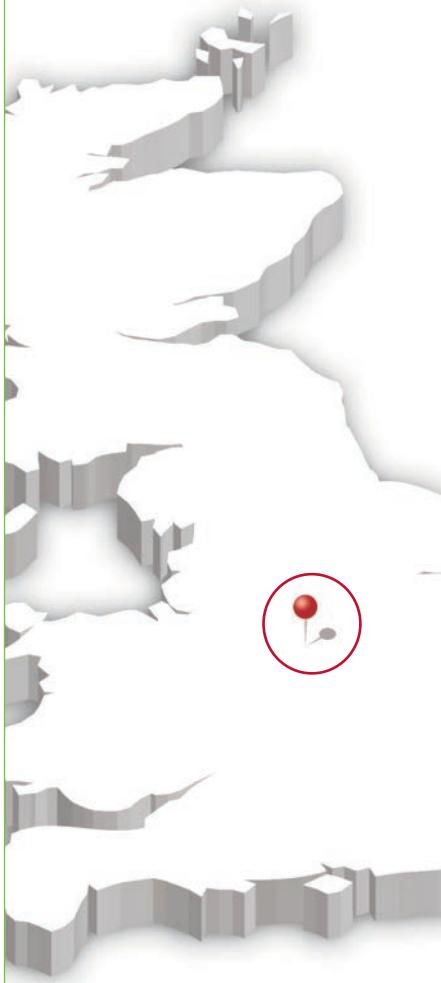
A vaccination can be given at the same time as the antitoxin, and a second dose of the vaccine should be given four weeks later. A third vaccination is then required at least four weeks after the second vaccination.

My horse has been vaccinated for many years and is now retired – do I need to continue vaccinations?

Unlike in humans, there is no evidence as yet that a given number of vaccinations will lead to lifetime immunity. Vaccination is always a choice weighing up the risks, costs and as tetanus is a fatal disease in horses, the risks are high for the unvaccinated individual. It is not uncommon for owners of older horses to cease influenza vaccination for economic reasons; however, influenza is not usually a fatal disease.

Like most vets, I would recommend active vaccination against tetanus for the lifetime of your horse or pony.





Veterinary surgeon

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Cut out and keep: Best worming practice

There are several different models upon which to base a worming programme (**figure 1**) of which targeted strategic worming in response to faecal egg counts (FEC) is the best.

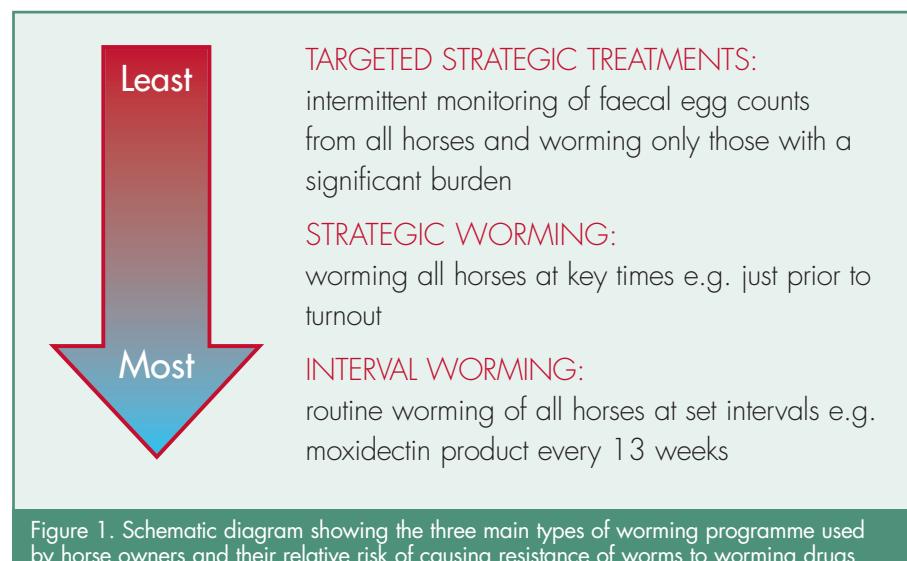


Figure 1. Schematic diagram showing the three main types of worming programme used by horse owners and their relative risk of causing resistance of worms to worming drugs



FEC Key Facts:

- FEC is a diagnostic test performed by a lab to determine how many adult egg-laying worms your horse has

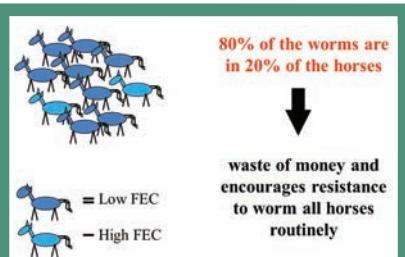


Figure 2. Schematic diagram illustrating that 20% of horses in any given field provide 80% of the worms on the pasture such that targeted treatment of these high shedding horses is cost efficient and helps decrease the risk of resistance.

- Use of an FEC directed worming programme reduces resistance of worms to worming drugs AND saves you money (**figure 2**)
- FECs only detect adult worms and therefore a product (moxidectin) able to kill immature worms (larvae) in the gut lining (**figure 3**) should be used in all grazing horses, once per year in the winter, regardless of FEC results



Figure 3. Encysted small strongyle (cyathostomin, redworm) larvae in the large intestinal gut lining

- FECs are unreliable for detecting tapeworm infections as eggs are shed intermittently and therefore a tapewormer (praziquantel or double dose pyrantel) should be given in the autumn (+ spring if no poo picking/many horses coming and going on yard)

Best Practice: Horse Factors

- Try to keep old and young horses separate from the main herd as these age groups tend to have higher egg counts.
- Give wormer doses based on an accurate weight; use a weigh tape!
- Quarantine newcomers for 48 hours and treat with a moxidectin/praziquantel combination wormer.
- In the UK there is widespread resistance of small strongyles to benzimidazole wormers so their use should be restricted to properties where efficacy has been proven using a faecal egg count reduction test.
- Likewise, many properties have ivermectin-resistant roundworm (*Parascaris equorum*) and pinworm (**figure 4**)



Figure 4. Irritation and trauma of the skin around the anus due to pinworm infection

(Oxyuris equi) populations - speak to your XLEquine vet if you have wormed your horse and seen no improvement in clinical signs.

- Look at the drug in the wormer, not just the wormer name; there are many differently named products but actually only four classes of wormers: benzimidazoles (fenbendazole), avermectins (ivermectin and moxidectin), pyrantel and praziquantel.
- Drug classes should be alternated annually to reduce risk of resistance e.g.
- Year one:** give ivermectin products for FEC based deworming from late spring to autumn; one of these treatments could be combined with praziquantel for anti-tapeworm therapy in the autumn; give all horses a moxidectin treatment in winter for encysted larvae.
- Year two:** replace ivermectin products with pyrantel products for FEC based deworming giving one in autumn at the double dose for tapeworm control; give all horses moxidectin encysted treatment in winter.
- Different drug classes have differing lengths of persistence and therefore, if an interval programme is used, the interval between wormers should be adjusted accordingly: moxidectin 13 weeks, ivermectin 8 weeks, fenbendazole 4-6 weeks, pyrantel 6-8 weeks.

Best Practice: Management Factors

- Base worming programmes on FEC rather than using interval worming to decrease the risk of resistance developing to worming drugs (**Fig. 5**).
- Do not overstock pasture (provide one grazing acre per horse as a rule of thumb).
- Remove faeces regularly from pasture (at least twice weekly).

- Cograzing pasture with sheep or cattle to reduce pasture contamination.
- Harrow on a hot, sunny day. This exposes eggs to high temperatures and reduces pasture contamination. Harrowing in any other weather increases contamination as it just spreads eggs all over the pasture.

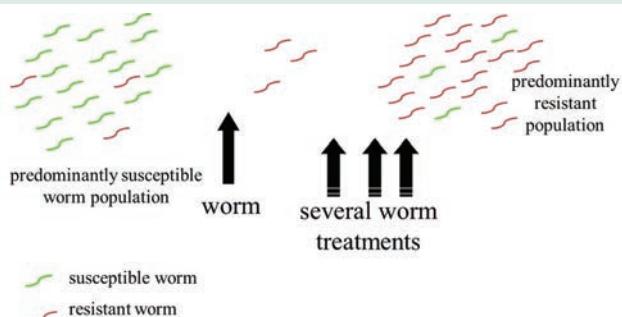
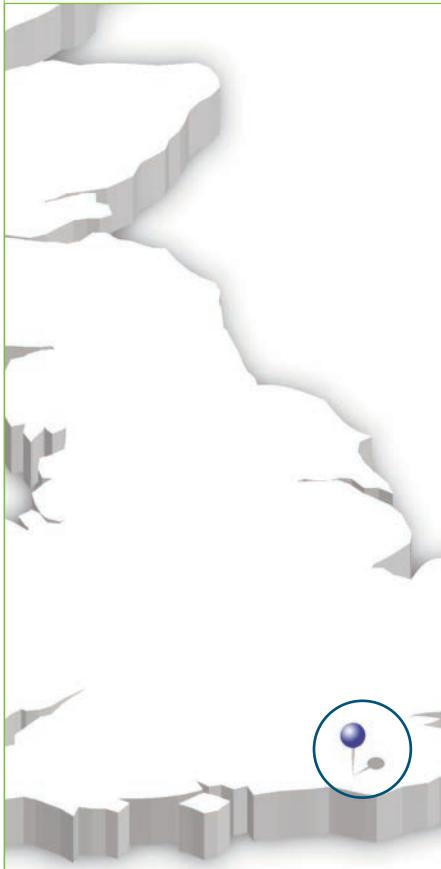


Figure 5. Schematic diagram showing how the regular use (overuse) of worming products in interval worming programmes leads to the development of resistance to worming products.



Veterinary surgeon

Rebecca Goodwin

XLEquine practice

Cliffe Veterinary Group



CLIFFE EQUINE

EQUISTRO

Rebecca Goodwin BVetMed CertAVP(EM) MRCVS
Cliffe Veterinary Group

Managing Diarrhoea

Diarrhoea refers to the passage of watery faeces, (**figure 1**) as opposed to relatively solid faecal balls of a normal horse. In basic terms, it can occur due to increased speed of movement of food through the gastrointestinal tract, increased water secretion into the gut and/or reduced absorption of water by the hindgut. If the horse lives at grass rather than in a stable, diarrhoea can be harder to identify, but faecal staining of the tail (**figure 2**) or scalding of the skin around the horse's back end is obvious.

Figure 1. Profuse diarrhoea in a horse with *Salmonella* spp. infection

Figure 2. Diarrhoea staining of the tail

Acute watery diarrhoea in a foal or adult horse should not be ignored and warrants discussion with your vet. One of the main functions of the horse's colon is to reabsorb water, therefore profound diarrhoea usually suggests significant disease of the colon. This is often called 'colitis', especially if inflammation of the colon wall has occurred. Dehydration can rapidly occur due to the ensuing massive water and electrolyte losses, possibly leading to endotoxaemia or 'septic shock' (**figure 3**). Horses can lose up to 50-100 litres of fluid in 24 hours due to diarrhoea and so can deteriorate very quickly.

Following initial digestion in the stomach and small intestine, food material passes into the colon and caecum - a huge voluminous reserve containing millions of 'friendly' bacteria. It is here where fermentation and digestion of plant material occurs in the horse that otherwise would be indigestible and a wasted food source. It is also at this location that fluid is secreted and absorbed to maintain intestinal water regulation of the horse. Therefore, when there is damage to the colon wall and it can no longer regulate this balance, diarrhoea occurs.

There are multiple causes of diarrhoea in the adult horse and often, despite repeated clinical examinations and extensive diagnostics, a definitive diagnosis can be frustratingly difficult to identify. However, treatment is often similar and therefore can be initiated before a specific diagnosis is

made. Causes of diarrhoea in the adult horse include infective agents, such as *Salmonella* spp. or Clostridial bacteria and parasitic infections, most commonly small strongyles (redworm/cyathostomins). Non-infectious causes include recent antibiotics or non-steroidal anti-inflammatory administration, toxin or sand ingestion. Sometimes anxiety alone in a nervous or fractious animal will lead to the temporary production of watery faeces.

Diagnostic investigations include assessing faecal material for larval stages of small strongyles (redworm), bacterial culture and DNA analysis of faecal samples. Ultrasonography of the intestinal wall can be very useful for assessing and measuring colon wall inflammation and thickening, and may help specify a diagnosis. For example, in cases of diarrhoea related to recent nonsteroidal anti-inflammatory drug (NSAID) administration (e.g. 'bute'), a specific syndrome of colitis of the right upper colon occurs (known as right dorsal colitis), which can be identified ultrasonographically. Bloods are often taken to assess the degree of inflammation present, to help rule in or out infectious disease, and to assess the degree of dehydration.

If a causal agent is identified, treatment can be tailored more specifically, however general treatment principles include correction of dehydration and restoration of normal electrolyte balance. This can be

achieved through oral fluid supplementation or, if required, via an intravenous drip.

The inflammation may be severe enough for protein to be lost across the intestinal wall resulting in low protein levels within the blood. Clinically this may be apparent as oedema or fluid swelling of the lower legs and under the belly (**figure 4**). In very severe cases, intravenous plasma may be needed to restore blood protein levels.

Use of antibiotics in diarrhoea is controversial and generally not advised as their use can directly result in diarrhoea. Anti-inflammatories will often be administered for both treating the pain associated with acute diarrhoea and also for controlling the inflammation; however, they must be used carefully, as they can further compromise the bowel health and lead to other further complications in a dehydrated patient.

For mild cases which remain bright and eating without systemic signs, a course of probiotics alone may be utilised to help restore hindgut bacterial health, although there is little scientific evidence to support their use. Other additional treatments may include bio-sponge, an oral product which can help support a healthy intestinal function and can absorb toxins from the bowel.

The prognosis for a mild case of diarrhoea is generally good, although more severe cases of colitis carry a far more guarded prognosis.

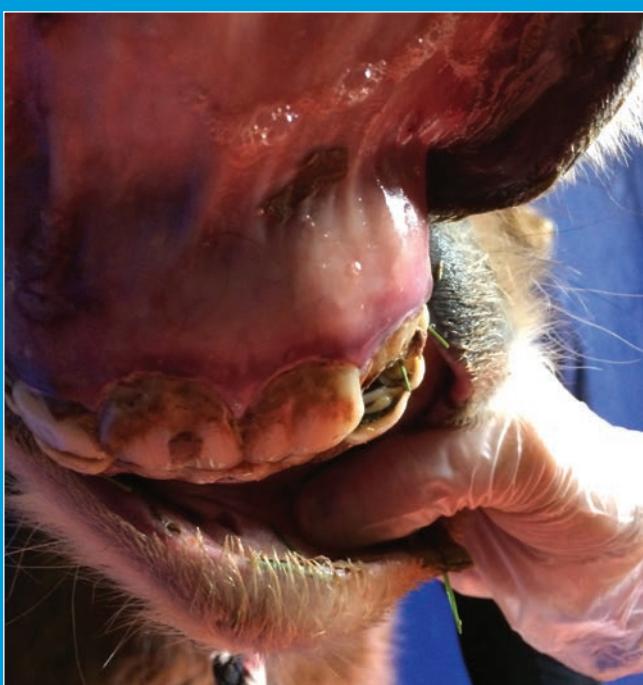


Figure 3. Gums that are deep red with a purple ring are a hallmark feature of septic shock



Figure 4. Oedema (tissue fluid) accumulation under the belly in a horse with low blood protein due to redworm (small strongyle) associated diarrhoea



Veterinary surgeon Lorna Buckley

XLEquine practice North West Equine Vets Ltd



Lorna Buckley BVMS MRCVS, North West Equine Vets Ltd.

The use of probiotics in horses

Many horse owners feed their horses probiotics in the belief that they help maintain digestive health; but what exactly are probiotics, how do they work and when should they be used?

The digestive system of the horse is populated by a diverse range of bacteria and yeasts, known as the microflora, that play a key role in the health of the animal. Disturbances in the gut microflora have been associated with colic, laminitis, grass sickness and colitis (figure 1). Probiotics are live bacteria and yeasts that are thought to play a role in preventing or treating disease by maintaining or restoring the microflora. They are different to prebiotics, which are a source of food that helps probiotics to grow in the gut. Probiotics are generally considered safe, are easy to administer and fairly low cost which, together with extensive marketing, has led to their increasing use.



Figure 1. Probiotics may help stabilise the gut microflora in patients with diseases affecting gastrointestinal motility, such as grass sickness

So what is the evidence that probiotics really work in horses?

Dietary yeasts have been shown to increase the digestible energy of feed and improve fibre

digestion in horses, although not all studies have reported beneficial effects. Of the most commonly studied yeasts, *Saccharomyces cerevisiae* has been shown to increase digestibility of fibre and protein, especially in horses fed low quality forage, and *Saccharomyces boulardii* has been shown to reduce duration and severity of acute diarrhoea. However, other studies have shown no effect and further research is required to evaluate the potential for live yeasts to help in cases of colic, laminitis and other diseases.

Yeast are often included in commercial feeds, so additional supplementation may not be required and is perhaps best reserved for horses on poor quality forage or for treatment of specific conditions based on veterinary advice.

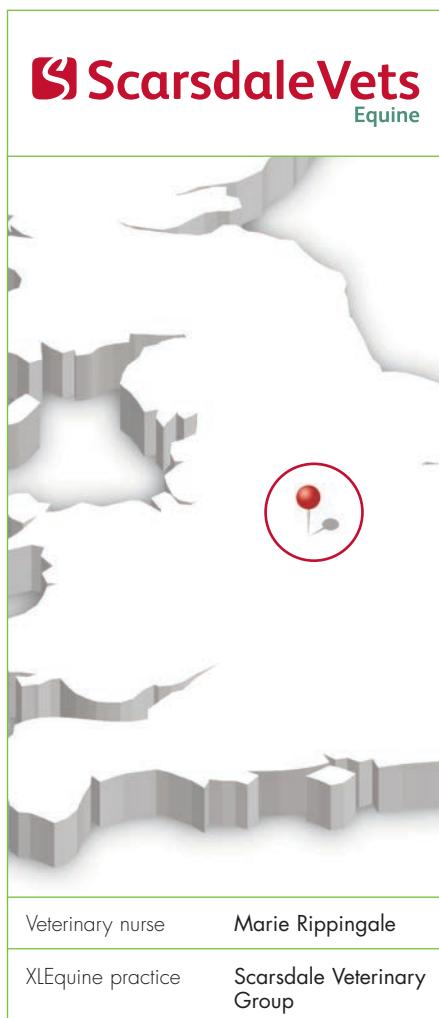
Scientific evidence to support the use of bacterial probiotics is even more limited. Studies on foals with diarrhoea have found that some bacterial strains do have a beneficial effect, whereas others actually increase the severity of diarrhoea. Individual strains can have very different effects and must be carefully tested and proven. More research is needed before recommendations can be made regarding the use of bacterial probiotics in horses.

As with many supplements it is likely that probiotics do have a role to play in equine medicine but they are not a cure-all and individual products need to be carefully evaluated. It is important to be aware that the type and quantity of organisms in commercial probiotics is highly variable and in the main do not contain nearly enough to exert a clinical effect. If you are in any doubt about whether a product is suitable for your horse please consult your veterinary surgeon for advice.



Marie Rippingale REVN, Dip HE CVN, Dip AVN, Scarsdale Veterinary Group

Nursing the recumbent horse



ScarsdaleVets
Equine

Veterinary nurse Marie Rippingale
XLEquine practice Scarsdale Veterinary Group



Horses can become recumbent for a number of different reasons such as:

- laminitis
- myopathy (muscle damage)
- atypical myopathy (sycamore poisoning)
- malnutrition and emaciation
- arthritis

Management of recumbent equine patients requires intensive nursing care as well as management of the primary disease. Subsequently, this level of management presents a serious challenge to the veterinary team providing care for the patient. Horses do not cope well when recumbent for the following reasons:

- They are designed to stand up for 23 hours a day
- The weight of their body pressing down on their diaphragm can make breathing difficult
- The blood supply to the muscles is greatly reduced when the horse is recumbent and this can lead to soreness and discomfort
- Horses develop pressure sores (decubital ulcers) on bony prominences such as the elbow and stifle
- Horses find it difficult to eat, drink, urinate and defecate when recumbent.

When nursing these patients the basics need to be covered first. A deep, clean bed should be provided and if possible, the patient should be placed in a padded recovery room. These rooms, often used when inducing anaesthesia often have a winch and overhead runner beam installed. This means there is provision to sling the patient to get them to stand if this is appropriate (**figure 1**).



Figure 1. A sling can provide support for weak horses to help them stand while they recover from illness or injury

Food and water must be put close to the patient so they can access it easily. The patient will often need to be hand fed if they do not have a good appetite. If the patient is not drinking, an intravenous (IV) catheter will need to be inserted and IV fluids given (**figure 2**).

The patient will need to be kept seated in sternal recumbency (on their chest) as much as possible. This aids adequate ventilation and prevents fluid build-up in one dependent lung. If this is not possible, the patient should be turned at least every 6-8 hours. Human safety is a major concern during this process, especially if the patient is an adult horse. Prevention for decubital ulcers includes padding the vulnerable areas, providing deep, clean, dry bedding and massage to encourage blood flow to the area (**figure 3**).

Grooming is very important for recumbent patients, not only does this increase the blood flow to compromised muscles, it also facilitates social contact between the patient and the nurse. As horses are gregarious animals, meant to live in herds, they can often become depressed when isolated and this can compromise their recovery.

In summary, nursing recumbent patients is time consuming, difficult and sometimes dangerous. However, it does present a real nursing challenge and can be an incredibly rewarding process when the patient begins to improve.

Figure 2. Many recumbent horses require intravenous fluids. This horse is being monitored while receiving a whole blood transfusion



Figure 3. Deep straw bedding helps reduce the risk of pressure sores. Foals that cannot stand must be turned regularly

ASK THE EXPERTS...

Here, our experts will answer any veterinary or health related questions you may have. Just send them in to equinematters@xlvets.co.uk and your question could feature here.

**Graham Hunter BVM&S GPCert(EqP)
CertEP CertAVP(ESO) MRCVS,**
Ardene House Veterinary Practice Ltd



Question 1: My 15 year old Arab gelding has bone spavin and I have been using Devil's Claw, which I think helps. I compete in endurance rides and have been told that I cannot compete on Devil's Claw - is this correct?

Devil's Claw is a plant native to southern Africa. Its name comes from the small hooks on the plant's fruit. The active ingredient in Devil's Claw is called harpagoside, which is found in the plant's root.

Despite many anecdotal reports of the successful use of Devil's Claw in arthritis, results from human clinical studies are mixed and, as yet, there are no convincing controlled clinical trials to support its use. Devil's Claw does have properties that decrease levels of inflammatory molecules but research in animals suggest that this effect is lost by passage through the stomach i.e. administration by mouth. Additionally, stomach irritant side effects have been noted. From 1st January 2016 the International Federation for Equestrian Sports (FEI) added harpagoside (Devil's Claw) to the prohibited substances list. Endurance GB operates using the FEI prohibited substances list. Therefore any rides operating under the jurisprudence of Endurance GB would disqualify any horse tested positive for harpagoside (Devil's Claw).

Devil's Claw is frequently used in many equine supplements and so all endurance competitors are advised to be extremely careful and check in detail the ingredients of any supplements they are using. If there are known orthopaedic problems, such as bone spavin, please contact your vet regarding the many other legal ways to help manage this condition.

Imogen Burrows BVetMed CertAVP(EM) MRCVS, Cliffe Equine Clinic



Question 2: I've heard there is a new tapeworm saliva test - can you tell me if it is any use?

Tapeworm infections are associated with certain kinds of colic; however, diagnosing tapeworm burdens in the horse is a tricky business. Unfortunately, faecal egg counts do not detect tapeworm burdens accurately, so until recently the most reliable test available required a blood sample. However, a new test based on saliva has been released. Both blood and saliva tests look for markers (antibodies) of the horse's exposure to tapeworm and give a low, borderline or moderate/high result. The developers of the saliva test recommend deworming horses with more than one tapeworm present - those that fall into the moderate (1-19 tapeworms)

or high (>20 tapeworms) groups. Disease is only thought to occur when burdens are greater than 20 (**figure 1**). False negative results have been reported, but in all cases the horses with false negative results had tapeworm burdens of less than 20, therefore this was unlikely to result in disease.



Figure 1. Tapeworms in the hindgut

The blood and saliva tests seem to correlate well. Trial data suggests the saliva test has less 'memory' for previous burdens (indicating past rather than current infection), therefore saliva samples taken after successful deworming are likely to register a lower result sooner than the blood test. Considering current evidence, the saliva test is useful and should be considered a reliable option for evaluating a horse's exposure to tapeworm.

Paul Smith BVM&S CertEP MRCVS, North West Equine Vets



Question 3: I have read that new rules have been made about applying for a new passport for my horse. Is this true and what do I have to do now?

The requirement for foals to have an identification sketch done by a vet was removed when the legislation was last

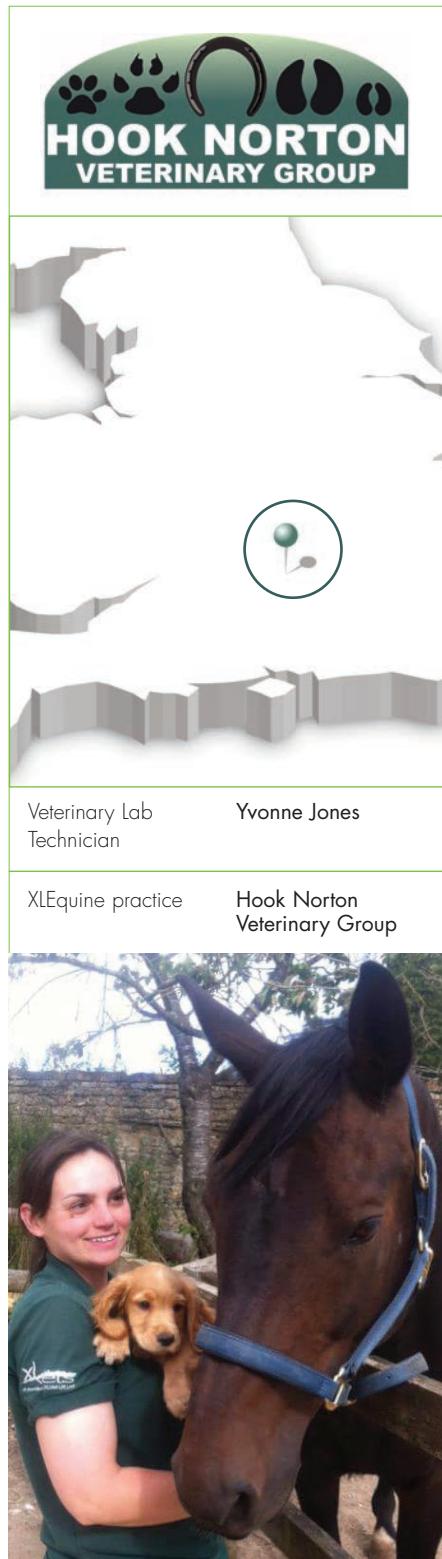
updated to include compulsory microchipping, but from January 2016, it has become mandatory for a sketch to be included once again. From July 2016, the UK will also be required to have a central database with records of all horse passports and microchip numbers, which will make it easier to trace horses' details if passports are lost.

It is still a legal requirement for all horses and ponies to have a valid passport issued by a registered Passport Issuing Authority. You could be prosecuted if you own a horse without a passport or transport a horse without a passport. Vets are required to check passports before administering or prescribing any medication. Section IX of the passport should be signed if you do not wish your horse to enter the human food chain. This allows vets to prescribe medicines such as phenylbutazone ('bute') which carry restrictions for food producing animals.

Yvonne Jones RVN, Hook Norton Veterinary Group

A day in the life of a veterinary lab technician

At Hook Norton Veterinary Group LLP we have a fully functional and busy in house laboratory, running samples from various species, for example, horses, cows, cats and dogs. We receive samples from our field and hospital equine vets. Samples consist of blood, urine, faeces, skin, hair or other bodily fluids. Tests we run include blood cell counts, blood biochemistry (protein levels etc), urine analysis, worm egg counts and dermatology (skin samples) to name a few.



Preparation of blood samples

We prepare samples from all species in the same format.

- First biochemistry blood tubes are spun in a centrifuge for three minutes (**figure 1**), to separate red blood cells from plasma (the liquid part of blood which carries blood cells). It is the plasma which is used in the biochemistry machine.
- The blood count sample is rotated for ten minutes, checking there are no clots, before introducing it into the haematology (blood count) machine. A slide is also prepared from this sample, air-dried and stained before examining cells under a microscope (**figure 2**).

The blood cells we look for and count are neutrophils, lymphocytes, eosinophils, basophils and monocytes (**figure 3**).



Figure 1. Blood sample being spun in a centrifuge



Figure 2. Specimen being examined under a microscope



Figure 3. White blood cells as viewed down a microscope

Neutrophils are involved in fighting infection and inflammation; lymphocytes are involved with immunity against viruses; eosinophils and basophils are released in response to allergic reactions or parasitic infection (e.g. worms); while macrophages help to mop up infectious agents.

Our equine clients also bring in faecal samples for worm egg counts. Faecal egg counts are important to ensure animals are dewormed with the appropriate wormer at the correct time, helping reduce the risk of worm resistance against the active ingredients in wormers. It is not possible to detect tapeworm and immature larval redworm (cyathostomin) infection by faecal egg counts.

Preparation of faecal egg counts

We examine samples from horses, sheep and cattle and must have at least a teaspoon of faeces to run the test accurately.

- The sample is mixed with 50ml of water and sieved into a clean sample pot.
- This sample is spun in the centrifuge to separate and concentrate the solid part of the faeces from the liquid.
- The liquid is discarded to leave the solid sample needed. A salt solution is added causing the worm eggs to float to the surface. This makes examination and egg counting easier under the microscope (**figure 4**).

All lab work and results are recorded in a lab book and on the animal's records to allow the vets to check and report results to

owners. As the practice is open 24 hours a day there is always a lab technician on call. At any time of the day or night, urgent samples could be delivered to the lab, these become priority for the lab technician to complete. No two days are the same, there will always be a variety of samples coming through the doors!

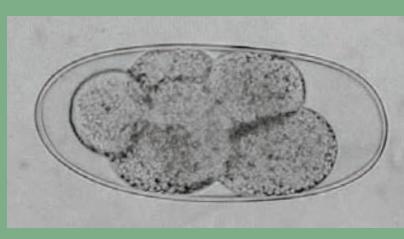


Figure 4. Small strongyle (cyathostomin) egg as viewed under a microscope in a faecal egg count

Hot potato – Does turmeric have a role in veterinary medicine?



**Graham Hunter BVM&S, GPCert(EqP), Cert EP,
CertAVP(ESO), MRCVS,**
Ardene House Veterinary Practice Ltd.

Turmeric is a spice well known for giving curries their traditional yellow colour. It has also been used for many years in Chinese and Indian cultures for its medicinal properties. The bioactive compound in turmeric is curcumin which is reported to have powerful anti-inflammatory and antioxidant properties. The amount of curcumin in turmeric is reported to be about 3% and it is known to be poorly absorbed into the bloodstream. Many turmeric supplements on the market do not have enough curcumin in them to have any real effect; indeed the amount required to have such an effect is unknown.

High standard nutritional supplements including turmeric products do have a place in the veterinary world, but the usual questions and problems arise. Where is the evidence, how much of the active ingredient is required

and how much is actually absorbed from the gut. Turmeric should never be considered a replacement for a correct diagnosis with appropriate conventional evidence based treatments.



Does Turmeric Have a Role in Veterinary Practice

Yes! Frankie, East Sussex

I feed turmeric to my 25 year old mare, Brook, as I heard good reports about it being used for joint maintenance. Brook has had anti-inflammatories daily, along with a well-known joint supplement, which was effective at reducing her stiffness to start with. Over time she stiffened up again, so I decided to look at turmeric as a cheaper alternative, whilst continuing with anti-inflammatories. I would say she seems as comfortable as before and her condition has not worsened yet, despite the wet weather and being stabled a lot this winter.

Brook also had lumpy, scurfy skin last summer, and after feeding turmeric the lumps have gone and her coat is very shiny - although I feed turmeric with a fair amount of oil which may account for the extra shine.



My conclusion is that turmeric is a very reasonably priced alternative to my previous joint supplement and I will continue to use it as a general conditioner...and they like it! :)

No! Rebecca and Briony, Northants

We are always happy to try new feed supplements; however, we are yet to see any true proven positive results due to feeding turmeric in either published research or practical use. Why reinvent the wheel when there are other products available which have proper scientific data backing up their claims, and/or which have a practical history of positive results.



**Rosemarie
Abbott
MA VetMB
MRCVS, Cliffe
Veterinary Group**

I have come across many a yellow lipped or lumped horse on my ambulatory rounds. Turmeric use is prevalent in the equine industry, but does it currently have a role in veterinary medicine? In my opinion, no. Granted, there is ongoing research into the anti-inflammatory and antioxidant properties of curcumin, the active ingredient in turmeric;

Turmeric, the new magic cure?



**Georgie Hollis,
Intelligent Wound Care Ltd.**

If you have not heard about the amazing virtues of turmeric then brace yourself. With claims it can cure cancer, epilepsy, Alzheimer's and depression, it might be time we had some on our porridge!

So is there any truth in it?

Turmeric has been researched heavily over the past 50 years with particular focus on its yellow pigment, curcumin. Curcumin makes up 2-5% of turmeric and has been researched widely *in vitro* (in the lab) demonstrating antioxidant, antimicrobial and anti-inflammatory properties.

So why aren't we all using it?

The issues that face us in terms of turmeric use begin with bioavailability (ability of the body to use it). Curcumin is not water soluble and needs to be blended with an oil (most advise coconut oil) to enable it to be absorbed into the bloodstream through the gut. Topical use is unlikely to have any systemic benefit.

Secondly, liver metabolism quickly reduces curcumin levels in the bloodstream. However, many users add pepperine (black pepper) to their paste which reportedly increases bioavailability up to 2,000 times by preventing metabolism in the liver.

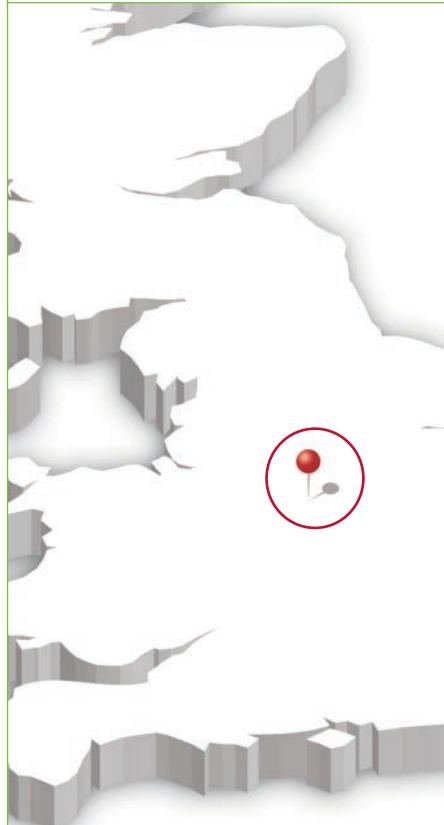
The truth is that much of the research to date is *in vitro* and not yet clinically robust enough to justify routine veterinary or human use.

with wide ranging potential clinical applications under investigation. However, so far, this research is being carried out in simple model systems and is a long way away from clinical trials in horses. The reverse of this is that there is as yet no proof that curcumin is useless.

I have not seen adverse effects caused by these products; while I do not recommend them, I do not attempt to stop owners administering. It may well be having a small beneficial effect...if only as a placebo for the owner.

Kirstie Pickles BVMS MSc PhD PGCert (Couns Skills) CertEM (Int Med) DipECEIM MRCVS,
European and RCVS Specialist in Equine Internal Medicine, Scarsdale Veterinary Group

ScarsdaleVets Equine



Veterinary surgeon

Kirstie Pickles

XLEquine practice

Scarsdale Veterinary Group



Against the Odds Feature: The Dummy Foal

Dummy foals are so called because they do not seem to know what to do. They show poor affinity for the dam, weak or absent suckle and often seem disorientated and display aimless wandering. The condition is also known by other more technical terms such as 'neonatal maladjustment syndrome', 'neonatal encephalopathy' and 'hypoxic ischaemic encephalopathy'. The fact that the disease has numerous different names is a sign that, as yet, we don't really understand what causes the syndrome! For a long time it was believed that dummy foals were starved of oxygen at birth causing brain injury, similar to cerebral palsy in people. However, many of the milder affected foals become clinically normal with only supportive nursing care (in some cases even going on to win the Kentucky Derby!), which makes lack of oxygen seem unlikely, at least in these less severe cases. An alternative more recent theory about the cause of dummy foal syndrome is that the foal does not get the appropriate 'switch' to change physiologically from foetus in utero to foal post birth. Squeezing dummy foals with a special rope technique as described below appears to work incredibly well at providing a signal to the foal that birth has occurred and that it is time to get up and act like a regular foal!

Donkey foal Floella was born normally without any complications, but at 8 hours old she had still not suckled from the dam and was weak and becoming dehydrated. She was aimlessly wandering round the stable (figure 1), had a very poor suckle reflex (i.e. she barely sucked if a finger was placed in her mouth) and could not latch onto the dam's teat.



Figure 1. Floella at 8 hours old showing classic signs of maladjustment - floppy ears, aimless wandering, lack of affinity for the mare and a poor suckle

The foal was fed colostrum through a tube passed up her nose and down into her stomach and then 'squeezed' using a new technique called the 'Madigan squeeze'. This utilises a special 20 minute rope squeeze technique to recreate passage through the birth canal and act as a wake up signal to the foal (figure 2). Immediately after releasing the rope, the foal stood and suckled from the dam (figure 3). Floella suckled well for several hours before starting to wander and have a poorer suckle reflex again; therefore, she was squeezed again. After this Floella never looked back and went from strength to strength. Now, at 6 months old Floella is a completely normal, strong, cheeky donkey foal (figure 4). If interested, you can read more about the squeeze technique at <http://www.equineneonatalmanual.com/#foolsqueezing/c1r2z>



Figure 2. Floella being squeezed using the Madigan squeeze technique



Figure 3. Floella nursing immediately following being squeezed



Figure 4. Floella as a cheeky 6 months old foal

pony pages

Welcome...

TO THE SPRING
XLVETS EQUINE PONY PAGE



Preventing Springtime Laminitis

As Spring approaches the grass will soon be growing into long, sweet pasture. This will provide lots of tasty meals for your pony, but it is especially important during springtime to look after his diet and minimise the risk of him developing laminitis.

What is laminitis?

Laminae are the tiny finger shaped pieces of tissue in the horse's foot which interlock, connecting the hoof wall to the pedal (coffin) bone. All of the horse's weight is transferred through these laminae so they have to be very strong! Despite this they are very delicate structures and are easily damaged. During a case of laminitis, the laminae become inflamed, causing great pain to the horse or pony. Eventually they can fail completely and the pedal bone becomes separated from the hoof wall and can 'sink'. This stage of the disease is very serious and can be fatal.

What causes laminitis?

- Allowing ponies to become overweight causes an increase in the hormone 'insulin' which directly affects the development of laminitis. The extra weight also has to be supported by the delicate laminae.
- Access to high sugar grass increases the amount of glucose in the bloodstream; this in turn increases the levels of insulin and the risk of laminitis.
- Other causes:
 - Cushings disease
 - Concussion of the feet
 - Stress
 - Severe lameness in another leg

How can you reduce the risk?

Strict diet and exercise!

- Feed according to work and type; ponies need relatively little feed to keep them healthy and happy!
- Restrict grass intake by strip grazing your pony's paddock.
- Turn out overnight when there is less sugar available in the grass.
- Feed high fibre/low sugar and starch such as soaked hay, avoid sugary feeds and haylage.
- Feed little and often to prevent boredom. Using a 'go-slow' haynet or doubling up haynets with small holes will also slow your pony down at meal times!
- Exercise your pony to keep it slim and healthy!

Take good care of your pony's diet and exercise regime – it is much easier to prevent laminitis than it is to treat it!
If you are ever worried about your pony's health contact your vet immediately.

Katherine Murray BVMSci, BVM BVS (Hons), MRCVS

Hook Norton Veterinary Group





competition page

Send us a selfie



New addition to the family - The Grey Stud family, including Grey Stud Santa Constantina



New pastures to explore!
Thank you kisses with owner.
Juliette and Lianne

New foal, enjoying life in the sun 'Poppy and Tink the orphan foal'



New pony, new adventure -
may the force be with us!
DJ and Heather



OMG!!! Precious Gem and Foal by Sempers Spirit at Grey Stud, Bexhill-on-Sea

Well done to all the great entries but this picture of a brand new foal stole our hearts and the prize for our '**New Beginnings**' competition
Send a Selfie' competition

Go riding and have fun along the way.
Charlie and Lauri



WiN!



The New Year can lead to new beginnings for many of us, and to demonstrate here are some XLEquine clients with their horses and ponies sharing what new beginnings in 2016 mean to them.

Your XLEquine veterinary teams will be focussing on preventative health care with our Picture of Health campaign. We want to help you keep your horses fit and healthy so that you can enjoy them through the summer months and beyond. We are here to help you better understand about worming, dentistry, foot care, infectious diseases and lots more.

In our summer issue of Equine Matters we would like to see photos of you and your horses looking a Picture of Health! If you would like to see yourself here, send your photos to equinematters@xlvets.co.uk with your name and a description and you could win an XLEquine First Aid Rucksack!

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XLEquine - Better Together

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2	Ardene House Vet Practice Ltd Aberdeen, Grampian Telephone: 01224 740700	10	Clyde Veterinary Group Lanark, Lanarkshire Telephone: 01555 660000	18	Midshire Veterinary Group Limited Nuneaton, Warwickshire Telephone: 02476 384064	26	Scarsdale Veterinary Group Derby, Derbyshire Telephone: 01332 294929
3	Ashbrook Equine Hospital Nr Knutsford, Cheshire Telephone: 01565 723030	11	Donald S McGregor & Partners Thurso, Caithness Telephone: 01847 892387	19	Millcroft Veterinary Group Cockermouth, Cumbria Telephone: 01900 826666	27	Scott Mitchell Associates Hexham, Northumberland Telephone: 01434 608999
4	Belmont Farm & Equine Vets Hereford, Herefordshire Telephone: 01432 370155	12	Endell Veterinary Group Salisbury, Wiltshire Telephone: 01722 710046	20	Northvet Veterinary Group Kirkwall, Orkney Telephone: 01856 873403	28	Severn Edge Veterinary Group Aston Munslow, Shropshire Telephone: 01584 841080
5	Bishopton Veterinary Group Ripon, North Yorkshire Telephone: 01765 602396	13	Fellowes Farm Equine Clinic Huntingdon, Cambridgeshire Telephone: 01487 773333	21	North West Equine Vets Rathmell, North Yorkshire Telephone: 0808 168 5580	29	St Boniface Veterinary Clinic Crediton, Devon Telephone: 01363 772860
6	Calweton Veterinary Group Callington, Cornwall Telephone: 01579 383231	14	Fenwold Veterinary Practice Spilsby, Lincolnshire Telephone: 01790 752227	22	Paragon Veterinary Group Carlisle, Cumbria Telephone: 01228 710208	30	Torch Farm and Equine Vets Ilfracombe, Devon Telephone: 01271 879516
7	Capontree Veterinary Centre Brampton, Cumbria Telephone: 016977 2318	15	Glenthorpe Veterinary Group Uttoxeter, Staffordshire Telephone: 01889 562164	23	Parklands Veterinary Group Cookstown, Northern Ireland Telephone: 028 867 65765	31	Wright & Morten Macclesfield, Cheshire Telephone: 08458 330034
8	Chapelfield Veterinary Partnership Norwich, Norfolk Telephone: 01508 558228	16	Hook Norton Veterinary Group Banbury, Oxfordshire Telephone: 01608 730085	24	Penbode Equine Vets Holsworthy & Okehampton, Devon Telephone: 01409 255549		