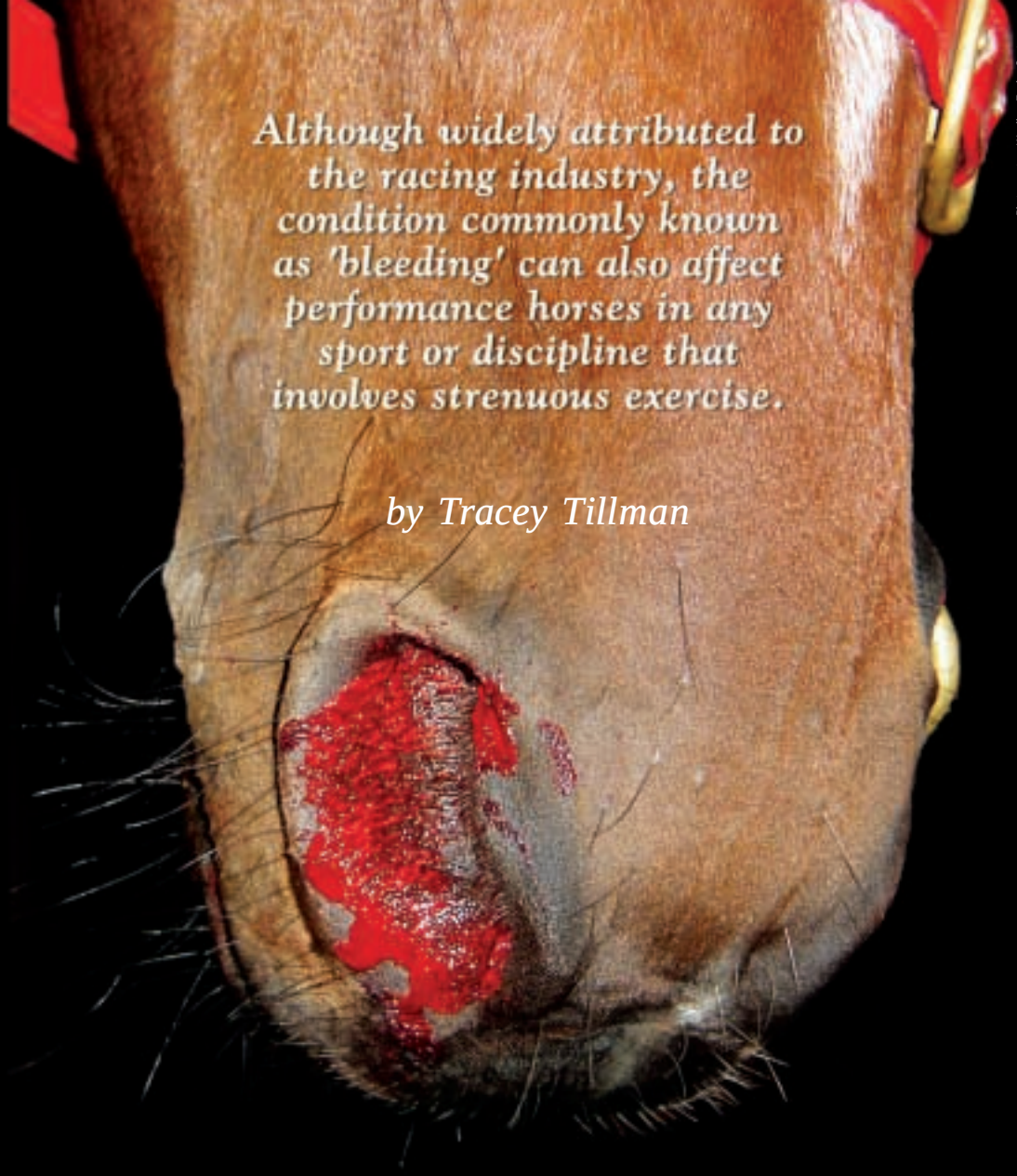

Photo courtesy Werribee Equine Centre

Although widely attributed to the racing industry, the condition commonly known as 'bleeding' can also affect performance horses in any sport or discipline that involves strenuous exercise.

by Tracey Tillman

BLEEDERS

Exercise Induced Pulmonary Haemorrhage (EIPH), also known as 'bleeding', has long been recognised as a potential occurrence in horses involved in moderate to high levels of exercise. Until the 1960's, it was thought the traces of blood coming from the nostrils that characterise this condition were due to bleeding inside the nose itself. Research since then, however, has shown that it originates from damage to the small blood vessels deep inside the lungs (pulmonary capillaries). This damage occurs primarily in the top back corner of the lungs just below the saddle.

In simple terms, the 'bleeding' associated with EIPH occurs when there has been a 'blow out' effect in these thin-walled blood vessels - causing them to rupture and release small amounts of blood into the lung itself. In many cases, this is as far as the blood travels so, outwardly, there is no change in the appearance of any discharge from the horse's nose after exercise. At times, however, a proportion of the blood in the lungs may make its way into the windpipe (trachea). When this happens and if the volume of blood is large enough, some may appear at the nostrils - usually prompting concern and, hopefully, further investigation.

Not Just Racehorses!

To date, most research and education about this condition has been directed towards the racing industry (Thoroughbreds and Standardbreds) yet, somewhat disturbingly,

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'bleeding' has also been observed in polo ponies, showjumpers, eventers, western competition horses (particularly barrel racers), dressage horses and even amongst those used purely for recreational activities. The difference is that, while those involved in the racing industry are fully informed of the consequences of their horse suffering a 'bleeding attack' and are forced to take remedial action, the same doesn't apply to the performance horse industry. In effect, this means either a bleeding attack might go un-noticed - due to a lack of awareness on the owner's part - or be 'glossed over' as an occasional happening that doesn't warrant further investigation, both of which may have significant consequences if the horse continues to be strenuously exercised.

Current research indications are that only a small number (1-2%) of cases where bleeding within the lungs actually shows bleeding from the nostrils. This means there are likely to be many instances where the condition remains undetected, but where inflammation and scarring of the lung tissue is ongoing. Furthermore, there is then a tendency for abnormal blood vessels to grow into the damaged area to help it to heal. This process contributes further to the increased likelihood of and susceptibility to further bleeding. The damaged area of lung can also be an ideal environment for bacteria to colonise and establish a localised infection.

Most importantly, in relation to a performance horse, the reduced ability of the lungs to function effectively as an oxygen exchange mechanism is likely to impact on its capacity for strenuous work. In other words, severe bleeding into the lungs prevents oxygen from being transferred into the bloodstream where it is needed to fuel working muscles. The end result is that, despite the best of care, feeding and training, the horse simply isn't able to run as fast, jump as high or work for as long as it's owner needs or wants it to!

THEORIES

Of all the theories as to what actually causes the damage to the pulmonary (lung) capillaries, two are considered to be the most probable. The first is based on the belief that the ruptures are directly due to the enormous amount of pressure generated within these tiny blood vessels during strenuous work. In other words, as the speed of exercise increases, the heart pumps faster and blood pressure within the lungs rises in an effort to keep up with the demand for delivery of oxygenated blood to the muscles and the removal of waste products. The end result, according to this theory, is a pressure imbalance between the pulmonary capillaries and the gas exchange airspaces (alveoli) within the lung. The outcome? Something has to give and, in this case, it's the thin walls of the capillaries that come off second best. It is interesting to note here that the blood pressure level in exercising equines can be much greater than in other elite athletes, including humans and racing greyhounds.

Right:

Current regulations force the racing industry to take action if a horse suffers a bleeding attack. This is not the case with competition and pleasure horses, and there can be significant consequences if the horse continues strenuous exercise.

Below:

An endoscopy involves passing a small camera on a flexible tube through a nostril into the windpipe, to determine if blood is evident and indicative of the 'bleeder' condition.

Photo courtesy Werribee Equine Centre.

The other theory is that the impact of the horse's front hooves on the ground during exercise causes a type of 'impact wave trauma', which is transmitted up the forelegs to the shoulder blades (scapulas), through the chest wall then to the skeleton. In doing so, it is proposed, this 'wave' also passes through the soft tissues of the lung from front to back - causing microscopic tears, leakage of fluid (oedema) and potentially, rupture of blood vessels and a bleeding response as seen in horses with EIPH. It could even partly explain why the bleeding response occurs in horses that are not necessarily 'running flat out'.

If the latter theory sounds a little 'far-fetched', consider how damage by a wave action occurs in the human body - such as with the brain injuries experienced by boxers, where a relatively low impact blow to the front of the head reflects off the rear of the skull to cause concussion, as well as substantial tissue damage and blood clots in the back of the brain. Similarly, motorists can sustain lung damage - even as a result of low speed accidents - due to the impact of the steering wheel on the chest. In this case, the region of damage is not at the front of the lung but at the back, where the wave has reflected off the back of the chest wall and spine.

This is a fascinating area of research, with many questions as yet unanswered but it appears that the mystery surrounding why EIPH occurs may even be eventually solved by combining these two schools of thought. It appears that both the 'increased blood pressure' and the 'impact wave trauma' theories have merit but the exact relationship, between the two in terms of prompting a bleeding response is still unclear.

WHAT TO LOOK FOR

Unfortunately, in the majority of cases, aside from visible signs of bleeding in nasal discharge, the signs and symptoms associated with EIPH are fairly vague, so it is a matter of knowing your horse's usual capacities for work and noting any subtle changes. Signs to look for include a general loss of speed, losing momentum when working at a given pace, rapid swallowing shortly after a hard workout or competition, recovering more slowly than usual from strenuous exercise, abnormal or choking sounds from the mouth and nose during work, coughing and headshaking during or immediately after work. Although this is a rather unpleasant thought, it has also been suggested that the breath of a horse suffering from EIPH may smell 'porky' - especially after exercise!

In addition, horses have a poor cough reflex so there can be relatively large amounts of blood or mucous present in the airways without the presence of a cough. Instead, because they usually take one breath to each step when cantering and galloping, horses may appear to 'gulp' as a consequence of 'missing a breath'. This is a very subtle sign but can be worth further investigation - especially when coupled with the main indicator of a loss in performance.

DIAGNOSIS

Diagnosis of EIPH can be achieved a number of ways, with the key diagnostic methods including endoscopy, blood sample and a Bronchoalveolar Lavage (BAL).

An endoscopy (commonly known as 'scoping') involves passing a small camera on a flexible tube through a nostril and into the windpipe (trachea) of the horse, with this procedure best performed within two hours of exercise. An endoscopy alone is not enough to diagnose the condition, but if blood is evident, it is often indicative of EIPH. Some veterinarians use a simple grading scale from either 1-4 or 1-5 to describe the amount of blood present on examination, with Grade 1 representing flecks of blood only and Grades 4 and 5 (depending on which scale is used) denoting airways completely filled with blood.

A blood test may also be recommended, mainly to detect signs of infection.

A Bronchoalveolar Lavage (BAL) is used to detect the presence of blood in the air passages of the lungs (alveoli) and small airways. This technique involves the insertion of a long tube (with or without an endoscope) through the nostrils, down the trachea and deep into the lungs. Sterile water (saline) is injected then fluid removed to obtain a sample of cells. By examining the number and types of cells located in the lungs for signs of inflammation, infection or other problems, a more accurate diagnosis is possible. White blood cells containing haemoglobin pigment can also be present for over two weeks after a bout of EIPH.

Signs of EIPH might include a general loss of speed, rapid swallowing, slower recovery from strenuous exercise, abnormal or choking sounds, coughing and headshaking during or immediately after work.

Ideally, a combination of all three diagnostic tools should be used, as this represents the most accurate method for identifying EIPH and assists in ruling out other conditions which can present similar symptoms.

PREVENTION AND MANAGEMENT

The bad news is, it is virtually impossible to prevent EIPH in high performance horses, however there are steps that can be taken to reduce the severity and frequency of incidences of bleeding.

Limiting exposure to dust and airborne particles that may interfere with lung function is a sensible precaution so strategies such as damping down feed with water or vegetable oil, using low-irritant stable bedding such as coarse sawdust or wood shavings and working in dust-free areas wherever possible may help. This is also a good strategy to help minimise the risk of secondary infections. In addition, adhering to a warm-up period of at least ten minutes before hard or fast work - especially in cold conditions - is recommended.

Swimming isn't a recommended form of exercise for known bleeders - particularly for those with a tendency to 'swim hard'. This is because when a horse swims, it breathes in a different manner than when galloping - holding the lungs full of air for longer than usual before exhaling forcefully. Thought to be a means of maintaining buoyancy in the water, this explosive breathing pattern causes the pressure in the thorax to be nearly three times greater than it is when galloping - even though the heart rate may not change significantly.

A number of medications have been trialled in the treatment of bleeders - the most successful being aimed at reducing blood pressure and others (which have so far failed to stand up to critical evaluation) claiming to strengthen the artery walls. A well known

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Herbal Perspective on

BLEEDING

by Robert McDowell

There are those who say that all competition horses bleed from the lungs at times, which is probably true. Unfortunately, Exercise Induced Pulmonary Haemorrhage is the outcome of a 'design problem' within the equine body where certain aspects have been designed with maximum efficiency in mind, but go very close to their structural limit in order to achieve this.

What is happening to the air sacs within the lungs as large masses of air are being forcefully drawn in and out - not to mention the jarring effect each time the hooves come in contact with the ground - is a bit like a bubble bath trying to stand up to a hurricane! Of course, this 'design problem' isn't so much of an issue when horses are in their natural state - it's only when there is human intervention in terms of diet, gait, training and racing that it becomes a more serious issue.

Herbal medicine has much to offer in the sense of strengthening the walls of the pulmonary capillaries, minimising the scarring of the lungs that develops each time a bleed occurs, dealing with the heart strain and shock associated with a major bleed and generally enhancing respiratory health. As a maintenance program for horse's regularly undertaking strenuous exercise, the inclusion of Rue, Hawthorne, Rosehips and Buckwheat (the commercial source of Rutin) in their diet is beneficial in improving the efficiency of the lungs. A cup full of buckwheat added to each grain meal and a tea made from a 1/3 cup each of Rue Herb, Rosehips Granules and Hawthorne Leaves soaked in boiling water and split between two feeds a day is a great preventative that is simple to manage.

A special 'bleeder mix' containing Hawthorn, Borage Herb, Kelp Powder, Nettle Herb, Rue Herb, Yarrow Herb and Yellow Dock can be prescribed as a twelve week course following a bleeding attack and as an ongoing preventative measure. This is able to be fed safely during normal training and competition, and does not contain any swabbable substances.

Other herbs that may be useful include Comfrey, Elecampane and Marshmallow. As with all herbal treatments, it is best to seek professional advice on the quantities and type of herbs to feed rather than experiment with this yourself, as there are usually precautions of which you should be aware.

The difficulty faced is distinguishing between a simple bleed, which can show in the nostril after strenuous work and has very little significance and a severe bleed, which for all the correct and humane reasons should be cause for alarm. There don't seem to be any answers to this dilemma apart from preventative measures but it is my opinion that multiple 'scoping' does more harm than good.

About The Author

Equine Herbalist Robert McDowell offers a four month rehabilitation program specifically for 'bleeders' at his medical agistment property in New South Wales, which combines herbal treatments with training and exercise programs. More information can be found on his website at www.herbal-horsekeeping.com

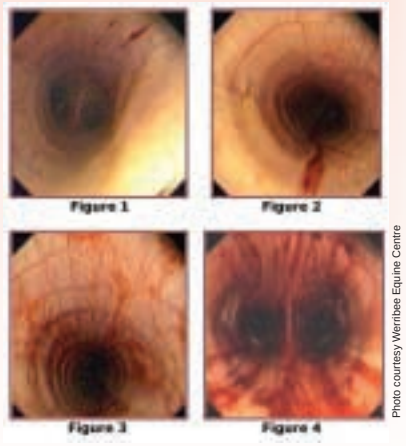

Photo courtesy Werribee Equine Centre

A grading scale describes the amount of blood present on examination with an endoscope, with Grade 1 representing flecks of blood only and Grades 4 and 5 (depending on which scale is used) denoting airways completely filled with blood.

treatment that research has demonstrated some success with is called fruesemide (commonly known as Lasix) - a diuretic used in human medication to reduce hypertension. This drug is predominantly used for 'potential bleeders' to reduce the chance of bleeding in the lead-up to an event, as it is a prohibited sunstance that must be withdrawn from the system seven days prior to racing or competition. Care must also be taken with this medication as its use could increase the risk of dehydration - especially in hot weather conditions.

The evaluation and treatment of 'bleeders', especially in relation to the performance horse industry, is still controversial and the subject of ongoing research. In the meantime, it would seem that horse owners, especially those aspiring to the higher levels of competition, would be well advised to be vigilant in monitoring their horse's performance under strenuous exercise conditions and have any early indications of EIPH fully evaluated.

Hoofbeats thanks Professor Andrew Clarke, Werribee Equine Centre, Victoria; Dr Chris Johnson and Dr John Kohnke for their assistance.