

TALKING DRESSAGE

ISSUE 5 2011



From the editor...

Wow, time goes fast! It's almost the time for Dressage with the Stars at Werribee and the CDI in Sydney. I hope that all of you who are competing have a successful competition. And to those who attend to support a rider, or as a spectator, that you enjoy seeing our top riders compete.

Dressage in this decade has a large following and it is one of the equine disciplines which is still growing in popularity, boosted by high level spectacles such as the regular state and national competitions.

In this issue we look at training methods to achieve the fitness, strength and suppleness required in a dressage horse. Many articles focus on riding technique and training methods, but a scientific review to explain the ways we can improve fitness and strengthen specific muscle groups is helpful in developing a training program. In all modern human and equine athletic sports, the word 'specificity' is used to emphasise the need to train certain muscles and strengthen tendons and joints loaded by exercise and also adapt the blood and nervous system as a total 'fitness' package for a given sport. Dressage training is an equine sport which requires a high degree of fitness by both the horse and rider, which may take years to hone for optimum performance.

Keep your goals and enjoy your dressage! All the best,

Dr John Kohnke BVSc. RDA

RESEARCH ROUND-UP

A Review of Collapse in Horses

Working and resting horses in otherwise good health can suddenly 'collapse' for a variety of reasons, with or without loss of consciousness. It may be a single episode, or in more severe cases, become a repeated and dangerous condition, particularly if it occurs under saddle. Dr. Catriona Lyle and Dr. John Keen of the Royal Veterinary School in Edinburgh, Scotland, have recently reviewed 'Episodic Collapse in Horses'.

Collapse can be classified as a 'syncopal' or 'non-syncopal' episode.

Syncopal collapse results in a loss of consciousness and muscle tone caused by a sudden drop in blood pressure in the brain or hypotension, such as occurs in a 'blackout' in humans. The horse will collapse but will spontaneously recover when the blood pressure is restored. A horse can suffer a sudden loss of blood pressure to the brain as a result of a severe fall during competition or a large volume of blood escaping from a large wound or artery rupture; suddenly lifting its head high off the ground which can reduce blood flow through the carotid artery to the brain; pooling of blood in the lower legs when a horse stands relaxed tied to a rail for an extended time, or as a result of nerve impulse blocks to and within the heart muscle, atrial fibrillation with rapid weak beats and heart valve disease, as can occur in an aged horse, or cardiac muscle damage following a severe viral endocarditis.

Non syncopal collapse is not related to brain perfusion, but is linked to seizures, sleep disorders, viral or plant poisoning induced encephalitis, hypoglycaemia as can occur in horses with starvation related hyperlipaemia and in HYPP affected Quarter Horses consuming high potassium roughages or pasture.

Diagnosis and treatment is complicated as the underlying cause may be difficult to identify. However, safety and welfare issues related to the collapse, especially in ridden horses, must be assessed, particularly following more than one episode. Repeat episodes are usually associated with severe cardiac or neurological disorders. Self-harm to the horse and injury to a handler or rider may be a reason for euthanasia. Consult your vet for advice.

Reference: C.Lyle, J Keen (2010) Episodic Collapse in Horses. EVE, pp 576-586.

In this issue...

- * Physical Fitness-Preparing your horse for Dressage
- * Collapse in Horses-Research Review

Plus handy hints and lots more!

Handy Hint : Extending Stride Length

A flowing, long stride is paramount to improve dressage movements. Some horses are born with a natural long stride because of their sloping shoulder and long limb conformation. Although fitness training can develop specific muscle groups to encourage strength and stamina, as well as extend the stride length and overtrack distance, hoof trimming to maintain adequate heel height but leaving the toes slightly longer, can help improve the mechanical flow of the stride for extended movements. Fitting heavier shoes can also increase the forward 'fling' of the stride by increasing the limb momentum within the forward stride. Loosening the shoulders by shoulder-in exercises also strengthens the haunches and makes the shoulders more flexible to extend stride length.

Handy Hint : Worming your Horse

Over the past 2 years, there has been growing concern by equine parasitologists and veterinarians regarding the effectiveness of current worming compounds and 6-8 week set worming intervals in controlling equine internal parasites. There are no new worming compounds becoming available for horses in the near future. Recent overseas studies have indicated that resistance to some of the current compounds by Large Roundworms, Pin worms and Small Strongyles or Small Redworms has developed. It is therefore important that we change the way we worm horses to help prolong the life span of current wormers until new compounds can be developed and tested. Adopting a well planned worming schedule is essential to maintain wormer efficiency and avoid rapid build-up of resistance. This involves the use of Faecal (Manure) Egg Counts to identify horses which have high worm burdens at 6 weeks after routine worming and those sharing the same pasture which appear to have low eggs counts in their droppings due to natural resistance against worm infestation. Young horses and aged horses should be targeted for more intensive control programs and worming intervals extended for middle aged healthy horses with low manure egg counts. Pasture management by limiting stocking rates, harrowing manure heaps, encouraging dung beetles, resting pasture in a rotation cycle and grazing with cattle to reduce manure and pasture egg and larval build-up is also important to break the pasture life cycle of common worms to reduce the reliance on worming alone. A 6 page worming review article with practical advice and information is available by emailing Gary at newsletters@kohnkesown.com.

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Kohnke's Own® Contact Details

FREECALL 1800 112 227 - FREE FAX 1800 112 228

Website: www.kohnkesown.com

Email: info@kohnkesown.com

Postal Address: PO Box 3234, Rouse Hill, NSW, 2155

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Physical Fitness - Preparing a Horse for Dressage

Dressage is a combination of mental and physical prowess to perform practised movements to exacting standards with harmony between the horse and rider. 'Dressage' is a French word meaning 'training' and programmed specific training is required to achieve the ultimate strength, fitness and endurance capacity required for elite competition. At all times, care has to be taken to ensure that a horse is not over-worked when it is tired or has symptoms of exercise fatigue.

Despite many claims that a dressage horse does not require a high level of physical fitness, in fact, collected dressage movements benefit from a much more sustained physical fitness as compared to many other equine athletic disciplines, especially in preparation for the advanced levels of the sport.

Dressage horses do not need the all out 'speed' fitness required of fast gaited sports, but they require **stamina, strength and suppleness** to perform dressage movements.

Training to Improve Stamina

Muscle power, stamina and precise neurological control and responsiveness to leg aids are important attributes for dressage movements. These are developed by repetitive exercises of the specific muscle groups in the back, hindquarters and limbs. Basic aerobic fitness conditioning is developed over the first 2-3 month period before fully collected extended gaits and more precise movements are introduced. However, it can take years to teach a horse and gain the fitness and suppleness required for more advanced movements to Grand Prix level of competition.

Ideally, a dressage horse should have a naturally free flowing and elastic stride which overtracks the hoof fall under the horse to exceed the centre of gravity location just behind the front limbs for balanced efficient movement. A dressage horse has to have strong conformation in the trunk, backline and limbs. This is especially important in the hind limbs and hocks to ensure impulsion power and optimum suspension in the stride for extended movements. These traits have been selected for in breeding many Warmblood horses to meet these physical attributes with a strong backline, long croup and gaskin to ensure the strength required for dressage.

Energy Usage

Energy expenditure is predominately from aerobic metabolism at speeds ranging up to 150 metres per minute. Conditioning has to be developed by long slow distance exercise (LSD) and use of principles of interval training in repetitive workouts to build efficient and sustained muscle power without fatigue. In a Grand Prix competition test, this speed and collected movements are performed for up to 8 minutes in the arena. Energy expenditure is less efficient at extended gaits and energy demand relative to body weight is higher as compared to the flatter, faster and non-collected movements of other equine athletes.

Therefore, although energy use for dressage movements is generally higher in proportion to the speed of exercise, a large amount of energy does not have to be stored as muscle glycogen accumulated from starch and sugar carbohydrate based diets, as would be required for a fast gaited horse, such as an eventer on the cross country phase. The major energy metabolic pathway is aerobic for dressage workouts with slow uptake sugars such as from barley, protein absorbed from the small intestine, hindgut fermentation of fibre in roughage to volatile fatty acids and fat as in full fat oil seed protein and vegetable oils which are useful to provide 'non-heating' energy. These sources help maintain a more sustained form of energy substrate in the muscles. However, some horses which lack impulsion or willingness to work, small amounts of starch based energy from oats, corn or rice to help maintain the 'oomph' needed to provide energetic and strong powerful movements, without resulting in 'fizzy', excitable behaviour.

It is well established that a horse's heart rate is directly proportional to the speed of exercise in a working horse. In a dressage horse, heart rates are higher for extended and suspended movements as compared to the less energetic gaits in both free reined and collected exercise. Heart rates are also higher for certain movements, with lateral movements, upward transitions and suspended movements requiring more strength and energy expenditure relative to the speed of execution.

Transitions, in particular, demand higher energy expenditure as additional energy is required for the propulsion power to shift the body weight during the execution of the movement and to reduce speed or brake in a downward transition to slow the body inertia.

Body Development and Proportion

Dressage movements require that a horse carries an increased proportion of its muscle bulk and body weight on the hindquarters for maximum impulsion and suspended power. The rider is also positioned deeper and further back in the saddle adding weight to the lower back and hind limbs. The hindquarters and limbs bear more body weight and inertia loading, thus requiring more strength and impulsion power as compared to non-collected forward movements at all gaits. However, the body development has to be proportional to ensure that the horse has the balance and muscle development in the shoulders and neck to enable strong collected movements, as well as the free-flowing, balanced and graceful movement required for dressage exercise.

Kinetic studies using high speed photography have shown that during collection, at each stride, the hip, stifle and hock joints flex downwards to absorb downward inertia and then extend upwards to push the horse off the ground in the impulsion phase of the stride. This cyclic loading and then power 'lifting' of the body, places higher loading on the extensor muscles on the front of the hind limbs as compared to other gaits and movements where the flexor muscles at the rear of the limbs propel the animal forward. The joints of the hind limb, especially the hocks and fetlocks, are flexed under the horse in a collected movement, so that the extensor muscles must be strengthened and develop the stamina and power to sustain repeated movement in the stride cycle, with increased suspension and joint flexion under loading. Therefore the horse must have strong hocks and fetlock joints to be able to withstand this cyclic loading and impulsion, especially in an extended or suspended gait.

Many aging dressage horses develop arthritic hocks, rear fetlocks and left front fetlock and these degenerative changes may be due to specific exercise loading. It is important, for this reason, to select horses for future higher level competition with a strong and balanced conformation. Horses which have underlying joint problems early in life, such as poor cartilage formation (Osteochondritis desiccans (OCD)) in the hocks or stifles due to too rapid growth or low trace-mineral intake in their formative years, or are purchased with a history of joint unsoundness, are more likely to suffer arthritic changes that can affect their long term potential for advanced dressage as they age.

Although, many Thoroughbred - Warmblood crosses contribute athletic agility to dressage movements, often they have a Warmblood sized body and a hearty Warmblood appetite, but a body which is carried on spindly Thoroughbred limbs and joints. A recent survey of top performing dressage horses in Holland found that having 25% Thoroughbred in a Dutch Warmblood cross was the best combination to produce a slightly lighter horse with desirable conformation and stride quality for dressage.

Strength Training

Strength training is essential to enable both collected and extended movements for the time duration required in dressage training and competition. This can be achieved by a combination of repetitive exercises which mirror the range, flexion, speed, energy expenditure and duration of future dressage competition. The horse must develop specific muscle groups for impulsion power and strength, but not restrict the athletic movement required to perform both collected and extended workouts by excess muscle bulk and weight

The major increases in strength or 'power' of muscle contraction result from an increase in muscle fibre diameter. This acts to increase the 'bulk' of the hindquarter muscles as well as the aerobic capacity of the slow twitch, impulsion or 'power' producing muscle fibres. Other muscle changes include an increase in the number of blood vessel capillaries within the muscle bundles to deliver more blood and oxygen for aerobic metabolism and protein to fuel muscle development as a horse progresses through the early conditioning period. Achieving these adaptations will take around 2-3 months of daily workouts at slow speed (100-150 metres per minute) over 1500-2000 metres daily



(Long Slow Distance or LSD exercise), without regular rest days. Once the exercise program has achieved the muscle development for sustained and impulsion power required in the horse for dressage movements, only regular maintenance exercise is needed in the training routine to maintain muscle strength and power. However, whilst optimum muscle bulk is required to shift the body weight, a horse should also be conditioned by controlled faster work outs. The inclusion of higher speed trotting and bursts of cantering over 500 metres at least 2-3 times per week will stimulate anaerobic metabolism for speed and athleticism in movement. If the arena is small (40 x 20 metres), then cantering exercise even on the diagonals, as well as the slowing of speed when cornering, may not be adequate to achieve the anaerobic threshold. In this case, straight line trotting and cantering on an even, concussion absorbing paddock surface will help to establish both increased aerobic and anaerobic capacity for endurance and speed.

Deep or heavy working surfaces make the work effort harder for the horse and this may help develop extensor muscle power and strength to enable a horse to improve the length of its under-body stride for collected movement. However, a high resistance working surface can overload back and hindquarter muscle groups to cause discomfort and chronic pain. Deep arena surfaces also place higher strain loading on tendons and risk spraining joints. The sacroiliac area is particularly prone to overload injury in the lower back as a rider sits further back in the saddle and the horse engages its hindquarters to propel itself forward, or sideways in lateral movements. When a horse is worked daily on a heavy or deep working surface the risk of injury increases so it is important that soundness in the joints and tendons must not be compromised to achieve more advanced movements.

There are a number of important principles to adopt when exercising a horse to increase its strength, power and stamina for dressage.

1. Repetition of Specific Movements During Training

Once a horse has achieved a degree of physical fitness by conventional long slow distance (LSD) exercise at the walk, trot and slow canter, more advanced movements can be commenced to strengthen specific muscle groups. Initially, transitions within and between the gaits will engage the hindquarters, improve extension and strengthen the back and hind limb muscles. Hind limb joint structures operating at extended angles will also be strengthened by these repeated exercises.

It is important to introduce strength training in a step-wise and repetitive program. It is essential that a horse must be able to perform a movement with the right degree of extension and power to stimulate the correct muscle groups to increase fibre size and aerobic power, before it is incorporated into the training routine. If the use of specific muscles is not conditioned to allow them to respond, the incorrect muscle groups may be strengthened. This will not achieve the desired progressive build-up in strength, impulsion and power to perform the precise movements.

At the start of the strengthening period, transition movements should be short, with loading (work) ratio to recovery (rest) period of 1:2. Once the horse masters a movement, then the number of movements per work session can be increased and the recovery period shortened, as programmed in an interval training form of establishing fitness. However, it is important to recognise the onset of fatigue, especially if a horse is not fit enough for the tasks or duration of the training period. This can be a problem during training lessons, where a certain time is allocated for the lesson to the pupil by the instructor. Horses can become tired and fatigued after 30 - 45 minutes of continuous work effort. **Once a horse fatigues, then weaker movements and recruitment of less specific muscle groups can occur and the wrong muscle groups may be conditioned by forced, on-going training.** An eager rider or instructor may continue to push a horse in an attempt to correct a movement and fatigue and discomfort can set in to make the horse resent the training.

HANDY HINT : Signs of Exercise Fatigue

Over-work during a training session may occur be relative to the horse's degree of fitness or overall health or dietary energy intake, or an underlying disease condition such as a respiratory virus. **Signs of impending fatigue include a loss of concentration, reduced impulsion in a movement, breaking a movement or disengaging, sweating more heavily, dragging the hind feet and working at a lower level in a flatter stride during transitions and extended movements.** If the weather conditions are hot or inclement, or the horse has had to travel a long distance to a lesson or is dehydrated, this may also influence the horse's willingness and physical performance. **It is important as a rider to recognise the signs of fatigue and equally an instructor should be observant and reduce the exercise intensity and allow a rest period at the walk.** Horses are not machines and forcing a tired horse to continue to get a movement correct is counter-productive and may cause pain and resentment, leading to avoidance and 'sourness'. Regular relaxed walking periods should be interspaced with specific movement training, especially if the weather is hot or the arena is deep or heavy after rain.

Handy Hint : Provide Specific BCAAs For Muscle Development

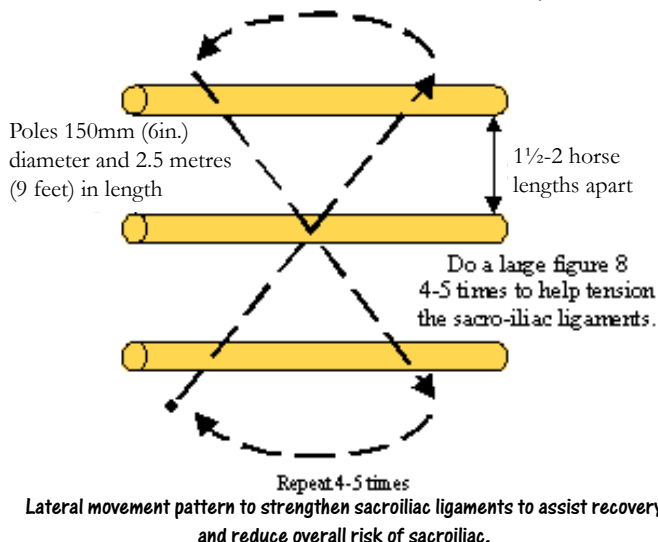
Muscles require a range of amino acids as the protein building blocks for increasing muscle fibre size and blood vessel proliferation in response to specific training. Common sources of dietary protein, such as oil seed meals and lucerne hay, in a diet containing 14% crude protein, provide a broad range of amino acids. This is an adequate diet in terms of energy and protein. A specific muscle 'food' will help to supply essential muscle building branched chain amino acids (BCAAs) including leucine, iso-leucine and valine, as well as glutamine and aspartic acid for recovery. Other muscle specific nutrients to optimise protein utilisation in muscle building include adequate intakes of vitamin E, zinc, organic sulphur, vitamin B6, manganese and magnesium. A daily supplement of **Kohnke's Own Muscle XL**, given in a small feed, such as a double handful of the hard feed fed within 20 minutes after exercise while the muscles are warm and recovering, will help feed the muscles with these specific nutrients. Normally the top-line and hindquarter muscle mass will respond in 10-14 days when combined with strength developing exercise. Recent studies in human athletes have also shown that post-exercise supplements of BCAAs helps minimise muscle fibre damage and assists recovery after strenuous or high loading sport activity. **Muscle XL** is based on human grade 80% crude protein whey powder (WPC 80) for optimum benefit and is not diluted by other 'fad' nutrients which have little or no benefit.

HANDY HINT : The Best Form of Warm-Up Exercise

It is important to warm your horse up by routine low level exercise prior to dressage training in an arena. Lungeing is the most common form of warm-up, but observations indicate that in a well conditioned horse, excessive loading and strain can occur on the inside front limb and fetlock on the circle before these structures become readily flexible and gain full movement. Studies have shown that lungeing at a trot, even in a wide diameter circle in excess of 3 minutes, can overload the lower limb joints in a heavy horse. Horses should not be worked at a canter on a lunge circle.

One of the most beneficial warm-up routines is to lightly massage the neck, shoulder and hind quarter muscles for 10-15 seconds on each side, then walk the horse on a lead (already geared up) over 3 parallel jumping poles spaced 4 metres apart on a flat surface, at an angle of 45° to the poles, in a figure 8 pattern for 4-5 laps. This exercise helps to flex the upper body and spine, strengthen the sacroiliac and lower back area, stretch muscles on both sides on the figure '8' turns and encourages the horse to lift its legs and lightly flex the tendons. Then a walk to the arena, mount and walk 60 metres up the centre line in a zig-zag pattern, turn at C and lightly trot in a zig-zag, shoulder in movement back to A to warm and limber up for the day's training exercises.

Lateral movement pattern to strengthen sacroiliac ligaments to assist recovery and reduce overall risk of sacroiliac sprain.





2. Uphill Exercise

Dressage training arenas are flat and therefore offer no muscular challenge to increase power in early training until specific collected movements, such as piaffe and passage, can be introduced.

The slope of the working surface can influence the energy expenditure for a given movement. Introduction of loading exercise given 2-3 times per week on a grassy, even paddock surface up a slope, helps to improve muscle strength and impulsion power. However, avoid pushing a horse in a 'get strong and fit quickly' program, as muscle and joint damage may occur.

HANDY HINT : Working up a Slope

In early training, work up a slope with a gradual incline (1 metre in 20 metres) over 400-500 metres at the walk initially. Then repeat at a slow trot 2-3 times per week in 2-3 repetitions between walk and recovery breaks, with the hindquarters engaged. This will help improve impulsion strength and power by recruiting and conditioning the extensor muscles. Return downhill exercise at a collected gait will help flex the hind limb joints and extend their flexion range for suspended movement. On the downhill slope, the collected movement can be interspersed with regular halts to improve muscle strength, power and balance.

3. Jumping During Training

Jumping exercise also helps to condition the extensor muscles in the hindquarters during take-off, as well as promoting use of the back and neck muscles to improve strength, balance and overall suppleness. However, jump heights should be small, limited no more than 55-60cms (1½ - 2 feet) to encourage controlled repetitive loading, rather than overloading and risk of sprain to joints or muscles by attempting higher jumps. A series of 4-6 small jumps set at 2-3 horse lengths apart can be used to condition extensor muscles, with return at the walk to the start to complete 3-5 repetitions to avoid overloading and fatigue and to allow recovery. The arena surface must be firm, preferably damp and even for jumping exercise. Avoid deep, shifting surfaces which can increase the risk of slip and slide on landing, resulting in tendon and joint overload and eventual unsoundness.

4. Lateral Movements

Lateral movements help to increase stride length and develop specific muscle groups, as well as improve overall balance and suppleness of the upper body and limbs. However, as lateral movements can be tiring in an unfit horse, they should be limited initially to 2-3 movements, interspaced with straight line free rein and collected workouts and rest periods at the walk.

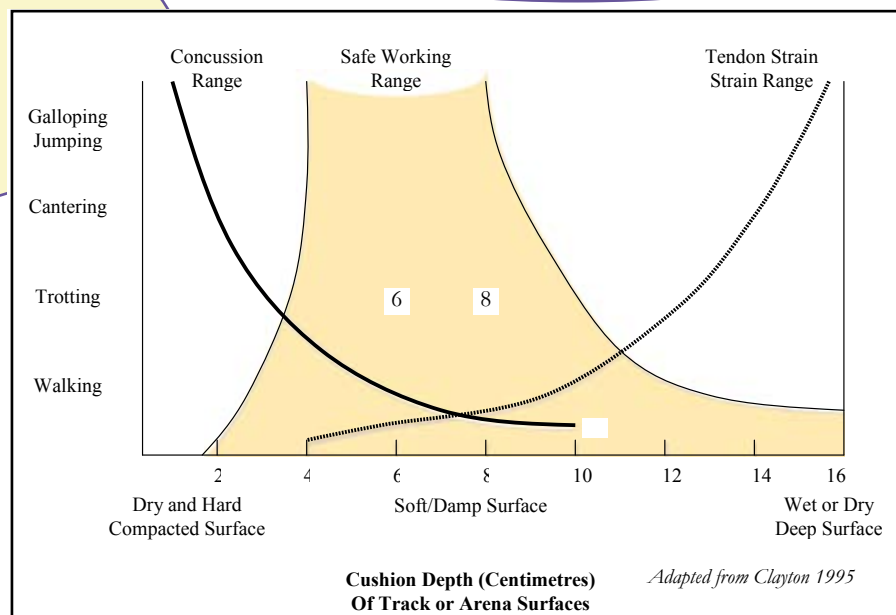
Conclusion

Dressage is gaining in popularity as an equine sport. It is important that a carefully planned training program using repetitions, jumping and hill work to improve strength, stamina and suppleness is adopted. A correct diet and adequate rest and recovery periods during work sessions must be included to avoid over working an eager horse or to meet a competition deadline. Dressage is a discipline which develops both rider and horse fitness and movement skills. It could benefit other equine sports as part of their training to ensure a horse develops discipline, poise and control, even in race horses.

Further Reading: Dr. Hilary Clayton is a world renowned exercise and training specialist with a passion for dressage. She has written many articles and book chapters on training the dressage horse using her experience as an advanced rider. Some of the information for the above review of strength training was referenced from "Conditioning Sport Horses" Hilary M Clayton. Sport Horse Publications 1991 pp 166-179.

HANDY HINT : Stretching Exercises

Stretching exercises are done by manually lifting, flexing the limbs back and extending the limbs forward and to the side before work and again after each day's training within 10 minutes following exercise while the horse is warm and cooling out. The exercises will help to free up spasms before exercise and stretch the extensor muscles in particular to aid elasticity before work and recovery after training. The stretch exercise must be passive and should not aim to cause resistance to extension of the limb by forward over-extension of each front limb. These exercises can be carried out with the horse in position and the girth adjusted loosely, before tightening the girth fully prior to mounting the horse. As the muscles stretch and become more flexible, the range of extension and flexion can be increased. It must not exceed the horse's comfort zone and create resistance to the movement and withdrawal of the limb by the horse, which may risk injury to you and the horse. Always perform stretching exercises on a firm surface and avoid slippery wet wash bay surfaces where a horse may lose its footing if it resists the stretch movement. Usually 2-3 forward and backward stretching movements of the full limb to the shoulders or hips will be sufficient to prepare the horse for work, as well as assist recovery after exercise.



PRODUCT OF THE MONTH

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