From the Editor...

Welcome to our second issue of Talking Horses - Dressage. The newsletter dedicated to the health and common problems associated with dressage horses. In our inaugural issue, we discussed the unwilling horse. There are a number of causes of hesitant or avoidance behaviour which were reviewed and you can obtain a back issue of Talking Horses - Dressage 1 by contacting Gary at newsletters@kohnkesown.co.uk or visit the website www.kohnkesown.co.uk.

In this issue, we review physical fitness and building up strength and muscle for competition, including a simple warm-up procedure which helps increase suppleness and agility.

We trust that you enjoy reading our dedicated newsletters.

An overview of the available issues is included to the left of this panel.

All the best for the summer dressage season.

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Handy Hint 1

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. Studies have shown that leg stretching exercises do very little in terms of preparing muscles for loading as these exercises are passive non-loaded movements. Lungeing is the most common form of warm-up, but 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. Many dressage riders warm their horses up at the walk and slow trot on a treadmill for 10-15 minutes before exercising the horse under saddle. If a horse is ‘over-energetic’ or ‘above itself’, which makes training difficult for control and comfort, then it is recommended to either walk and trot the horse for 10-15 minutes to ‘burn’ up excess energy, or to adjust its feed to remove excess starch based feeds. 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 sacroilitac 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.
Plan Regular Routine Strengthening and Speed Exercises

Physical Fitness
Preparation of a Horse for Dressage

Dressage is a combination of mental and physical ability 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 demand a much more sustained physical fitness compared with 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 and Strength

Muscle power, stamina and precise neurological control and responsiveness to leg aids are important attributes for dressage movements. These are developed over a 6 month or longer training period 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 school a horse and gain the fitness and suppleness required for more advanced movements to Grand Prix level of competition.

Free Flowing Movement

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

Handy Hint 3
Plan Routine Strengthening and Speed Exercises

Once the exercise program has achieved the muscle development for sustained and impulsion power required in the horse for dressage movements, only regular short periods of specific exercise movements are 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 working arena is small (40 x 20 metres), then cantering in movement. If the working arena is small (40 x 20 metres), then cantering exercise even on the diagonals, as well as the slowing down of speed when cornering, may not be adequate to achieve adequate anaerobic threshold and stamina fitness. In this case, straight line trotting and cantering on an even, concussion absorbing, grassy field surface will help to establish both increased aerobic and anaerobic capacity for endurance and speed.

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 stride power. The rider is also positioned deeper and further back in the saddle adding weight to the lower back and hind limbs. The hind quarters and limbs bear more bodyweight and inertia loading, requiring more strength and impulsive power, compared with 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 bulk in the shoulders and neck to enable strong collected movements, as well as the free-flowing, balanced and graceful movement required for dressage exercise.

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. They then extend upwards to push the horse off the ground in the impulsion phase of the stride. This cyclic loading, followed by impulsive ‘lifting’ of the body, places higher loading on the extensor muscles on the front of the hind limb, 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.

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. 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. The upper body power and strength, can result in a higher incidence of lower limb breakdown in horses with this weaker lower limb conformation, especially as a horse ages.

Did you know that...

Many aging dressage horses develop arthritic hocks, hind fetlocks and left front fetlock degenerative changes due to specific exercise over-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 or Osteochondritis dessicans (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 suffer arthritic changes that can affect their long term potential for advanced dressage as they age.
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 exercises which mirror the range, flexion, speed, energy expenditure and duration of future dressage competition. It must develop specific muscle groups for impulsive power and strength, but not restrict the athletic movement required to perform both collected and extended workouts by developing excess muscle bulk and weight.

The major increases in strength or ‘power’ of muscle contraction are achieved by an exercise-induced 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 the 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 work outs at slow speed (100-150 metres per minute) over 1500-2000 metres daily (Long Slow Distance or LSD exercise), with regular rest days.

Deep or heavy working surfaces increase the work load and may help develop extensor muscle power and strength to enable a horse to increase its stride sweep and improve the length of its under-body stride for collected movement. However, a high resistance working surface can overload back and propulsion 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 to encourage the horse to engage its hindquarters to propel itself both forward and sideways in lateral movements. When a horse is worked daily on a heavy or deep working surface, the risk of lower limb injury is likely to increase. It is important that soundness in the joints and tendons must not be compromised in an effort to achieve more advanced movements by overloading the musculoskeletal system.

Handy Hint 4
In early training, working up a slope with a gradual incline (1 metre in 20 metres) over 400-500 metres at the walk initially, will help place controlled loading to stimulate hindquarter and lower back muscle strength and impulsion power when collected up under saddle. Then repeat at a slow trot over 100-150 metres 2-3 times per week in 2 to 3 repetitions with the hindquarters engaged with lighter effort in between at the walk to allow recovery. This will help improve impulsive strength and power by recruiting and conditioning the extensor muscles. Return downhill exercise at a collected walk 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.

Handy Hint 5
Plan an Exercise Loading and Rest Period Ratio
At the start of the strengthening period, transition movements should be short with a 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 included in an interval training program to establishing fitness. However, it is important to recognise the onset of fatigue, especially if a horse is not fit enough for physical challenges or duration of the training period. This can be a problem during training lessons, where a certain time is allocated to the lesson to the pupil by the instructor. Horses can become tired and fatigued after 30-45 minutes of continuous exercise 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 school or correct a movement, resulting in muscle fatigue and discomfort which may make the horse resent the training.

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, then 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 slow speed 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 and adapt to the exercise loading, incorrect muscle groups may be strengthened. This will not achieve the desired progressive build-up in strength, impulsion and power to perform precise movements.

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.

Avoid pushing a horse under saddle up a steep slope (greater than 1 metre in 10 metres) in a ‘get strong and fit quickly’ program, as muscle and joint damage may occur. Working a horse under saddle down the slope of a hill can also improve muscle development on the front of the shoulders, but avoid excess downhill exercise as the wrong muscle groups for forward impulsion may develop as the horses attempts to ‘brake’ on the downhill descent. Do not work a horse diagonally up or down a slope as the weight loading on the angle of the slope will overload the pasterns and fetlocks and lead to ring bone, side bone pain in the hooves and uneven hoof loading. Refer to Handy Hint 4.
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, as well as tendon and joint strength. However, jump heights should be small, at no more that 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 a return at the walk to the start and then followed by 3-5 repetitions, to avoid overloading and fatigue, as well as allow recovery. The arena surface must be firm, preferably damp and even for jumping exercise. Avoid deep, shifting or rutted 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 can be used to increase stride length and develop specific muscle groups, as well as 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 to 30-35 metres initially across an arena over 2-3 movements, interspaced with straight line free rein and collected workouts and 2-3 minute rest periods at the walk.

Conclusion
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 that a horse develops discipline, poise and control.

Further Reading: Dr Hilary Clayton is a world renowned exercise and training specialist with a passion for dressage. She has written many articles and books on training the dressage horse using her experience as an advanced rider. Some of the information for the above review was referenced from ‘Conditioning Sport Horses’ Hilary M Clayton. Sport Horse Publications 1991 pp 166-79.

Disclaimer: The information and recommendations in this newsletter have been presented as a guideline based on the veterinary experience and knowledge of the author, John Kohnke BVSc RDA. Whilst all care, diligence and years of practical experience have been combined to produce this information, the author/editor, John Kohnke BVSc RDA, accepts no responsibility or liability for unforeseen consequences resulting from the hints and advice given in this newsletter.

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Step 2 - Give Muscle XL 15 minutes after exercise while the muscles are still warm.
Step 3 - Mix into a small feed of 2 handfuls of mixed feed. Or Make into a paste using an equal amount of water and garlic flavoured oil. Administer over the tongue.

Handy Hint 6
Signs of impending fatigue include a loss of concentration, reduced impulsion in a movement, breaking a movement or disengaging, sweating more profusely, dragging the hind feet and working at a lower level in a flatter stride during transitions and extended movements. It is important to recognise the signs of fatigue and reduce the exercise intensity and allow a rest period at the walk. Forcing a tired horse to achieve a movement 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 7
Provide Specific BCAAs for Muscle Development
Muscles need a range of amino acids as the 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 alfalfa hay or cubes in a diet that contains around 14% crude protein can provide a broad range of amino acids. Although, this diet may be adequate in protein, a specific muscle ‘food’ will help to supply essential muscle building branched chain amino acids (BCAAs), including leucine, isoleucine and valine, as well as glutamine and aspartic acid for recovery. This will help to help build and maintain muscle bulk, when combined with daily exercise under saddle. 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 within 20 minutes after exercise while the muscles are warm and recovering, will provide the specific nutrients to the muscles for strength and bulking up. Normally the top-line and hind quarter 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 help to minimise muscle fibre damage and assists recovery after strenuous or high loading sport activity.