

## ***Horse Training Using Swimming and Heart Rates***

One popular form of cross training that has long been used by many trainers is swimming. This is especially the case if the trainer has access to a well-designed swimming pool that can be utilized all year round. Swimming is seen as an excellent exercise for building horses cardio-vascular (heart-lung) fitness with the added advantage of minimizing the daily stress on the horses' legs from normal track training. For example, it has been suggested that a 10-minute swim is the equivalent to a couple of miles of a trot or canter on the track. Whilst swimming could be seen as an extremely non-specific training principle, it is amazing how many anecdotal stories you hear about horses racing successfully with a swimming component in their overall training program.

In general, the majority of horses swim well. However, when swimming a horse for the first time give it extra attention as some horses have been known to sink. When horses swim they employ a trotting or pacing gait and a breathing pattern characterized by brief inspiration, prolonged expiration, both of which look "painful and labored" to the inexperienced onlooker. The movement of the limbs through a wide range of motion is considered beneficial to flexibility. The difficulty in breathing when swimming is probably due to the pressure applied to the chest and abdomen of the horse by the water and the fact that the horse doesn't have the rhythm of body and abdominal movements that serve to help the breathing process during normal land training. As such, the horse has to rely on the respiratory muscles and it may be that swimming is a good way of training these muscle groups. Whether this training effect translates to the track is unknown, but it is possible that some direct benefit may apply. However, it should be noted that swimming also results in relatively high blood pressures compared with galloping and that some horses have experienced nose bleeding after a bout(s) of swimming. As such, swimming is not recommended for horses with respiratory disease and it is also contraindicated in horses with back injuries.

We recently monitored three (3) horses during a typical swimming session at a local stable using a ***POLAR Horse Trainer*** heart rate monitor. The heart rate response of each of these horses is shown in graphs 1-3. Horses 1 (Megamind) and 2 (Oakes Dream) completed the planned session while Horse 3 (Vallian Hero) "panicked" when entering the pool and was immediately taken from the pool. Each swimming session lasted approximately 4-5 minutes (6-8 laps of the pool) with heart rates averaging 169 bpm and 142 bpm for Horse 1 and Horse 2 respectively. If we assume a swimming maximal heart rate of 230 bpm for each horse (although the maximum heart rate of a horse are generally lower in water than on land), this represents 74% and 62%  $HR_{max}$  respectively which approximately equates to heart rates during slow cantering and trotting. Whilst only two horses were monitored, it would be

reasonable to assume that there could be a large variation in swimming efficiency between horses. Even in this particular example, for the same trainer perceived swimming training program, *Horse 1 was working approximately 19% harder than Horse 2*. So how could the trainer make Horse 2 work harder? One method that could be used is tethered swimming which involves securing the horse by a tail rope and encouraging the horse to a greater effort. A trainer we recently spoke to used another form of tethered swimming by hanging on to the horse's tail as it swam across the dam!

Finally, it seems that aquatic or underwater treadmills are starting to become more and more popular, particularly in America. Such training devices would have the added advantage of being able to control training intensity and diminishing the concussion of normal trackwork.

### ***What Does The Scientific Research Say?***

Japanese research has suggested that free swimming is similar in intensity to trotting and slow cantering – a finding in accordance with the two horses we measured. During a 4-week period of regular swimming a positive training effect was shown to occur as demonstrated by a decreased swimming heart rate at a set swimming speed. Swimming heart rates ranged from 140 to 180 bpm with blood lactates increasing by 2-4 fold above resting values. During the 4-week period horses were exercised for 5 minutes daily in the first week with the duration increasing 5 minutes each week thereafter. Prolonged swimming for 1 hour did not cause excessive increases in body temperature.

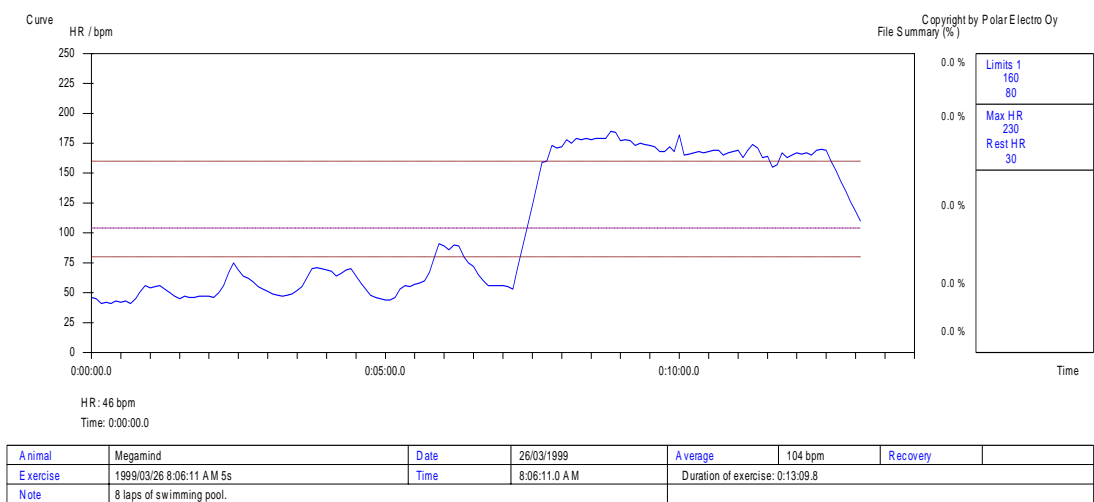
With respect to tethered swimming, an American researcher demonstrated that by securing horses by a tail rope, heart rates of 170-200 bpm could be reached during 5 minutes of continuous swimming. Blood lactate levels reached 1-10 mM.

### ***Summary***

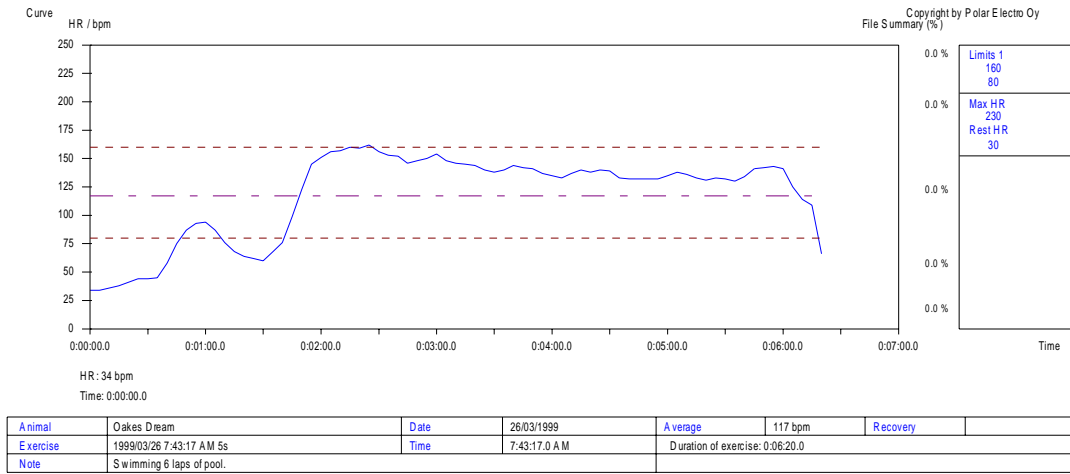
- ✓ Swimming programs could be considered for the following purposes: rehabilitation from injury, adding variety to an already existing training program, a recovery training session, cardiovascular training session (particularly young horses and injured horses).
- ✓ As the intensity of swimming may vary from horse to horse the swimming heart rates of each horses should be monitored. Tethered swimming and adding weight to the horse may be appropriate means of increasing the intensity of swimming.

- ✓ Actual swimming time rather than “laps of the pool” may be a more appropriate training volume prescription to use, with actual swimming time depending on the swimming capabilities of the horse and the requirement of the session.
- ✓ It is suggested that the direction of swimming in circular pools be changed regularly during prolonged swimming to avoid fatigue in the outside legs.
- ✓ Continually look for horses that may exhibit nostril bleeding after a bout of swimming and seek veterinary advice. Also, be careful with using excessive swimming sessions with horses that have back injuries.
- ✓ An individual and specific conditioning program could be designed and monitored for each horse using swimming heart rates and blood lactate measurements. The *Polar* cable kit can provide continuous heart rate feedback to the handler during the swimming session.
- ✓ If the swimming session is to be used for conditioning purposes, it is beneficial that horses warm-up prior to entering the pool. For first occasion horses, it is recommended they swim for only 1-2 minutes and increase to 10-20 minutes through planned progressive overloading.

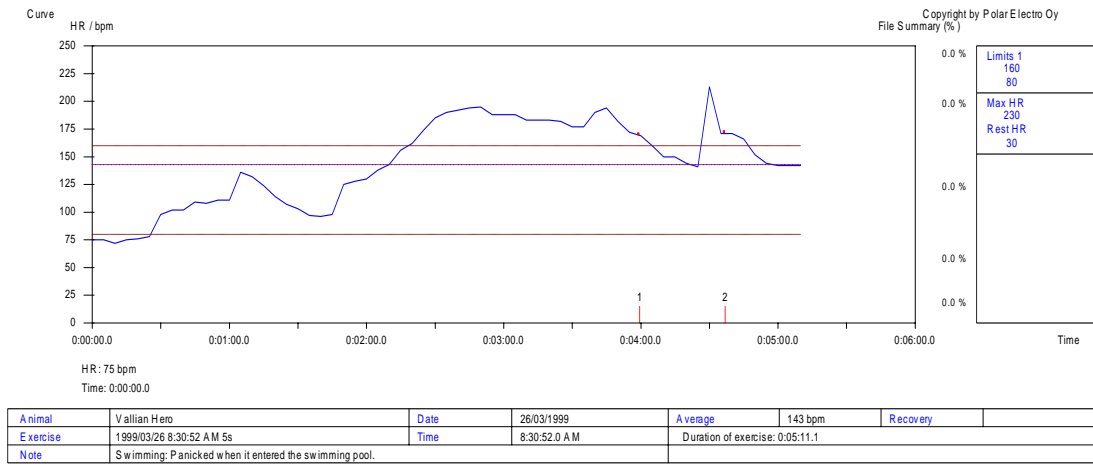
**Graph 1 Horse 1**



## Graph 2 Horse 2



## Graph 3 Horse 3



### Additional Reading

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