

Tacoma Equine Hospital

3112 – 156th Street E. Tacoma, WA 98446 ♦ 253.535.6999

ATHLETIC CONDITIONING

Spring is finally just around the corner and with it comes grand plans for you and your horse. Perhaps you have been riding regularly this gray, rainy winter, but most likely you have not. It's time to think about conditioning your horse to get him "fit and keen" enough to handle your plans!

The first step in starting a conditioning program is a simple health assessment and maintenance visit by your veterinarian. This will involve the usual dental exam and float, updated vaccines and a review of your de-worming program. More specifically, an exam of your horse's feet and legs and gait analysis will help identify potential problems and allow you to modify your conditioning program appropriately. Identifying if your horse is too thin or too fat will be important to determine, so that a proper nutritional program can be instituted in association with your conditioning.

"Fitness" is the ability to complete the required amount of physical activity without fatigue, stress or injury. Our goal is to prepare our horses for the rigors of athletic competition by increasing the work capacity, decreasing the risk of injury and delaying the onset of fatigue.

There are two kinds of exercise, aerobic and anaerobic. The relative importance of each depends upon the type of competitive event. A slow trot or canter over level ground is aerobic exercise as the oxygen inhaled by the horse can supply all the energy it needs. Muscles can utilize dietary fats for fuel for exercise at these speeds. Endurance horses are an example of horses performing aerobic exercise. Horses sprinting, like racing quarter horses and barrel horses are performing anaerobic exercise. In anaerobic exercise, the muscle must use stored glycogen for energy as this is done much more quickly. This cannot be utilized for long periods of time though; as the by-product of this process is lactic acid which when built up in the muscle causes fatigue. Other types of competitive events use both aerobic and anaerobic exercise when the need arises so training horses to improve the quality of both types is important.

There are four areas of the horse's body that are going to be affected by our conditioning program; the musculoskeletal (muscles, bones, tendons and ligaments), cardiovascular, respiratory and thermoregulatory.

Musculoskeletal

During aerobic training the muscle fibers themselves increase in number (both Type I and Type II) and the number of capillaries within the muscle increases. This increase in capillaries not only increases blood supply to the muscles; it also reduces transit time of blood, thereby allowing more oxygen to be exchanged and waste product to be taken away. Most importantly, there is an increase in mitochondria density and oxidative capacity.

Mitochondria are the organs in muscle cells that actually create the energy needed for muscle contraction. They can do this in two ways; either through utilizing fatty acids or using glycogen. As explained above, fatty acid utilization is clean, but slow energy used during aerobic activity and glycogen utilization is fast, but dirty energy used in anaerobic activity. The goal of

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conditioning is to increase aerobic capacity higher and higher to limit the fatigue caused by anaerobic exercise.

Of course training at anaerobic levels is important as well. The muscles change to allow more glycogen storage and higher glycolytic enzyme activity for a greater capacity for energy creation. Also importantly, the muscles create a greater buffering capacity against the effects of lactic acid buildup.

Cardiovascular

The heart is a muscle and so all the changes outlined above also apply to it. The stronger the heart muscle becomes the larger it gets and the more blood volume it can pump with each beat. This is called stroke volume. Relatively speaking the more volume that can be pumped per minute, the less number of beats needed to supply the body during exercise. This is why the heart rate of the fit horse during exercise is actually less than an unfit horse and the faster that the heart rate will return to normal during the recovery period. Training also increases the total red cell pool and plasma volume available to the body during exercise. Plasma volume becomes important to the thermoregulatory system discussed below.

Respiratory

The respiratory tract is already adapted to produce maximum performance regardless of training. It must be maximally dilated to supply oxygen during exercise and training. Where problems might occur is if disease is present. Anatomic abnormalities in the throat or chronic obstructive pulmonary disease can severely restrict peak performance.

Thermoregulatory

During exercise, 80% of energy produced needs to be liberated as heat; therefore the horse's thermoregulatory capacity is critical. A buildup of heat reduces the exercising potential of muscles (early fatigue) at the least and can cause death in some circumstances. This is especially important in high temperatures and humidity. How the hot horse cools itself is by diverting blood supply towards the superficial vessels of the skin where evaporation can occur. This leaves less blood volume available for exercising muscles. Also lost in sweat are large amounts of electrolytes and fluid volume that can cause decreased muscle contraction efficiency, dehydration and therefore fatigue. A fit horse has enough plasma volume and heart strength to accomplish high performance regardless of these stresses.

TRAINING PROGRAMS

So, knowing all this, how can we design a training program that will help our horse succeed? The first important principle is that of *progressive loading*. For an exercise adaptation response to occur (as discussed above), the horse must be subjected to a slowly increasing exercise load. If progression is too slow, time is wasted. If progression is too fast overload occurs. The second principle is of *specificity*. The specific muscles and systems used in the horse's discipline must be trained. The exception to this is the trail horse. These horses' simply need a solid base of cardiovascular fitness and musculoskeletal strength accomplished by regular conditioning

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sessions. Remember that all these changes are reversible. If you or your horse gets more than 3-4 weeks respite from conditioning, you need to start all over again.

The foundation phase of training is what to start with. This is an initial period of low intensity training for 6-8 weeks. How you start depends on the inherent fitness of the horse. Pasture ornaments starting fresh, simply need 10-15 minutes of longe line work 3-4 times per week to start. A horse that has been doing some work off and on may start with a more stringent schedule of 1-2 hour trail rides at a walk and trot 3-4 times per week. As a general rule increase your volume of training 5% per week and no faster. You can do this by increasing the length of, the speed of or the intensity (hill work) of the training session. Abide by the “hard-easy” principle. All hard workouts should be followed by an easy workout or a day off. Also, try and train on a variety of surfaces and terrains.

Towards the advanced portion of your foundation phase, make sure you increase speeds to engage anaerobic conditioning. The only way to improve your horse’s anaerobic capacity is to train at it. Some trainers advocate, “interval training” as a safe way to accomplish this. Measuring your horse’s fitness is important at this point. Subjectively you can notice whether he sweats as much as previously, or how fast his respiratory rate returns to normal after exercise. Objectively measuring heart rate during exercise is the most reliable. The speed at which his heart rate reaches maximum should increase over time.

The results of this foundation phase will be improved aerobic and anaerobic oxidative capacity, limb strength, less chance of injury and horse and rider education.

The specific preparation phase involves training and practicing for your specific discipline, whether it is pole bending, jumping, dressage or cattle sorting. Have fun!