

### SA 31 Effect of training on the activity of muscle enzymes in seropositive and seronegative equines for equine infectious anemia.

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*Efecto del entrenamiento sobre la concentración de enzimas musculares en equinos seropositivos y seronegativos para la anemia infecciosa equina.*

#### Introduction

Equine infectious anemia (EIA) is an incurable disease of equids with an almost worldwide distribution, being endemic in the Pantanal Matogrossense region, where the disease control through euthanasia of seropositive animals is not mandatory. Most studies about exercise physiology are performed in sport horses and little investigation is made for working animals (Santos et al, 2002), and there are no reports on functional performance of EIA-positive horses. Analysis of the activity of creatine phosphokinase (CK), aspartate aminotransferase (AST) and lactate dehydrogenase (LDH) are necessary to evaluate the skeletal muscle function. The objective of this study was to evaluate the serum activity of CK, AST and LDH in EIA seropositive and seronegative horses submitted to training.

#### Materials and Methods

Sixteen male of Pantaneiro breed equines (10 -16 years old) were used in this trial: 8 seronegative(G1) and 8 seropositive (G2) for EIA. Both groups were kept separately in nearby farms in the Nhecolandia region of Pantanal. They were kept free in natural pastures with mineral salt and water *ad libitum*. Performance evaluation tests were done before (T1) and after (T2) 42 days of physical training. Tests included progressive effort on a plane 1500m grass track, with the same horseman guiding each horse in jog, trot, canter and gallop gaits. During tests, all animals wore heart rate monitors and at the end of each step heart rate (HR) and blood lactate concentration ([La]) were measured. When an animal reached a [La]≥4mmol/L and HR>150bpm, the test was interrupted. Samples were collected at rest, 6, 12 and 24h after testing. During the training period (42 days), all animals worked on alternate days for 1h on walk and gallop. The individual gallop speed was determined as the speed at which the animal reached 3mmol/L of [La] in T1.

#### Results and Discussion

There was no difference ( $p>0.05$ ) in the activity of CK at the time of evaluation, between G1 (197.1IU/L) and G2 (252.9IU/L). LDH activity was different at the tests and at the times ( $p<0.05$ ). The lowest T1 concentration was observed at rest (516.9IU/L), and the peak concentration was reached 12h after the test (789.1IU/L). In T2, concentration peak occurred at rest (832.6IU/L) and 6h after the test there was a reduction of the LDH concentration to 428.2IU/L. LDH blood elevation at rest may have occurred by transient increase in membrane permeability and not by cell damage. In addition, there were no large elevations indicative of muscle injury. According to Boffi (2007) the strenuous exercise leads to a process of acidosis of the cells, which causes an increase in membrane permeability, causing normal elevations of muscle enzymes and not indicative of muscle damage.

Horses that suffered muscle damage show increases between 5 and 100 times the AST concentration. According to Harris et al (1990), serum CK and AST activities should not increase more than 250% and 50% of resting values, respectively, two hours after a submaximal exercise test, regardless of the athletic ability of the horse. Pathological changes are related to elevations greater than 100% of AST after exercise, regardless of exercise intensity or level of conditioning (Harris et al, 1998). There was difference ( $p<0.05$ ) at the experimental groups for AST but the CK, AST and LDH concentrations remained within the reference values, not having biological significance. The maximum reference values for CK of 570IU/L (at rest) and between 670-770IU/L (in training) For LDH and AST, 280IU/L(at rest) and between 375-500IU/L(in training) (Hodgson&Rose,1994)

#### Conclusion

It is concluded that the training protocol applied did not result in severe changes on muscle enzyme activities, demonstrating not muscle injury in G1 and G2 animals.

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