Race horses submitted to reduced training may show similar lactate threshold

For Standardbred race horses, training starts already as 1-year-olds with the goal for horses to race at the age of two or three. However, injuries and health problems are common among horses in training and historically less than half of each cohort of Swedish Standardbreds are able to race at least once before the age of four years. Training has the potential to affect both health and performance but still, until now, there have been no long term studies documenting the effect of different training strategies from breaking till racing in Standardbred horses.

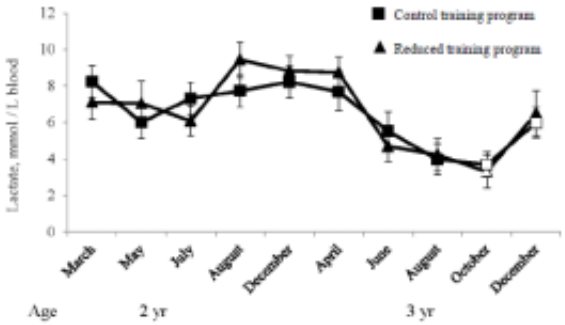

Fig. 1. Blood lactate after a 1,600 m-test at an oval racetrack in 16 2-3 year old horses divided in a control and a reduced training program since March as 2-year-olds. Unfilled dots indicate a significant difference from the starting point within group, * indicate difference between groups.

High intensity training, performed at high speeds, is commonly used to improve cardiovascular and metabolic functions and is, at least to some extent, necessary to improve performance capacity. However, although training may strengthen tissues, great volumes of high intensity training may also increase the risk of injuries. To lower this risk it would be desirable to train less, but without impairment of performance capacity. The aim of this study were to document physiological response in horses subjected to a training program where the amount of high intensity training has been reduced by 30 %.

To find out how physiological performance capacity is affected by a reduced amount of high intensity training a 2-year study in sixteen 2-3 year old Standardbred horses was performed. Horses were split in two groups allocated to either a control training program or to a training program where the amount of high intensity training were reduced by 30 % of the distance. The two training groups were balanced for factors known to affect performance, such as genetic potential and muscle fiber composition.

Performance in Standardbred horses has been related to aerobic capacity, something that may be indicated by lactate threshold, red blood cell volume and recovery heart rate. Horses in the study were tested continuously for lactate and heart rate response to exercise, recovery heart rate and haematocrit (a measure of red blood cell volume) in a standardised exercise test.

Fig. 2. Experimental horses during training. Photographer: Johanna Berg-Johansson.

The results showed that horses trained in the reduced training program showed a decreased haematocrit and increased recovery heart rate compared to horses submitted to the control training program, indicating lesser cardiovascular capacity. However, there were no differences in the lactate response to exercise or lactate threshold, a measure which has shown a correlation to race performance. Moreover, there were also no differences in the amount of horses that participated in a preparation race, qualified for races and raced as 3-year-olds between horses of the two training groups.

In conclusion; a reduced amount of high intensity training in 2-3 year old horses attenuated cardiovascular response but did not affect muscle metabolic response to exercise and did not affect race participation. This indicates that it might be possible for trainers of young Standardbred horses to reduce the amount of high intensity training, and thereby potentially lower the risk of musculoskeletal injuries, without affecting race participation or lactate response to exercise. The development of new training strategies with the potential to decrease the risk of injuries and increase the proportion of horses fit to race are important to the horse racing industry foremost from an animal welfare perspective but also for economic reasons.

Sara Ringmark
Swedish University of Agricultural Sciences
Department of Anatomy, Physiology and Biochemistry
Uppsala, Sweden

Publication

Reduced high intensity training distance had no effect on VLa4 but attenuated heart rate response in 2-3-year-old Standardbred horses.
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