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**ASSOCIATION BETWEEN RESTING ANGIOTENSIN-CONVERTING ENZYME (ACE) ACTIVITIES IN EQUINE PLASMA AND RACING SUCCESS FOR SPRINT AND ENDURANCE IN THOROUGHBRED RACEHORSES IN AUSTRALIA** Maria

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**Introduction:** ACE blood activities in humans have been linked with a genetic polymorphism which in turn has been correlated to better athletic performance and training adherence. In horses it has been demonstrated that similar genetic polymorphism exists but this only accounts for 10% of the variation in blood activities of ACE. We have demonstrated that ACE activities in equine blood are influenced by training and hypothesized that ACE activity in plasma correlates to capability to compete in high speed (high ACE) or endurance (low ACE) sports. The aim of this study was to investigate whether there is a correlation between distances raced by a group of professionally trained Thoroughbred racehorses and their plasma ACE activities close to racing. **Materials and Methods:** Monthly blood samples from 21 Thoroughbreds were collected for 6 months for measurement of ACE activity in plasma. An automated spectrophotometer was utilized for analysis. Data were collected from every race run during the study period. Races were classified as short/speed (up to 1400m) or long/endurance (more than 1600m) and horses were classified as place-getters (from 1<sup>st</sup> to 3<sup>rd</sup> finishing position) or non-place-getters. Results were analyzed by a T-test. **Results:** A total of 63 races were recorded, with 13 horses contributing to a total of 18 placings. Mean ACE activity for horses racing short distances was  $95 \pm 5.7\text{U/L}$  compared with horses racing longer distances which had a mean ACE activity of  $75 \pm 3.0\text{U/L}$ . When ACE activity was plotted against distance raced by the place-getters, a significant association was found ( $p = 0.018$ ). Horses with higher ACE activities raced more successfully at shorter distances, in contrast to horses with lower ACE activities that raced more successfully at longer distances. **Discussion and Conclusion:** Our results support the hypothesis that ACE activity in plasma inversely correlates with an ability to compete in speed or endurance sports. Horses with lower ACE activity presented better results in longer races, while sprinters with successful performance had higher ACE levels. This study confirms the potential to use blood ACE activity as a tool to match aptitude of equine athletes to different competitions.

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