

REVIEW >

RESEARCH

Purina® SuperSport™ Amino Acid Supplement Improved Performance, Increased Speed of Recovery, and Supported Muscle Development in Exercising Horses

A SUMMARY OF RESEARCH¹ CONDUCTED AT THE PURINA ANIMAL NUTRITION CENTER THAT EXAMINED THE EFFECTS OF DAILY ADMINISTRATION OF THE PURINA® SUPERSPORT™ SUPPLEMENT ON ASPECTS OF MUSCLE DEVELOPMENT AND FITNESS IN EXERCISING HORSES.

< INTRODUCTION >

Athletic horses are subject to rigorous training programs to help them perform their best. During strenuous exercise, muscle tissue sustains damage that can potentially have a negative effect on post-exercise recovery time. Amino acids are the building blocks of muscle protein, and feeding high quality amino acids is one way to facilitate muscle tissue repair and support muscle development. The objective of this study was to determine if feeding a daily supplement containing a specific blend of high quality amino acids, vitamins, and minerals affected aspects of muscle fiber integrity, overall fitness, and performance in exercising horses.

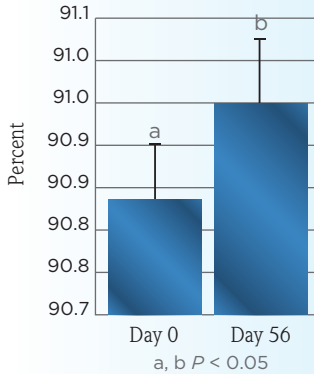
< MATERIALS AND METHODS >

Sixteen Thoroughbred and Quarter Horse mares and geldings were randomly assigned to one of two dietary treatment groups for 56 days: SS (Purina SuperSport; n=8) and AP (alfalfa pellets; n=8). Horses were housed in dry lots during the day and individual stalls overnight. The basal diet consisted of 0.5% bodyweight (BW) of Strategy® GX and 1.5% BW of grass hay per day, split into two meals. Supplements were top-dressed over Strategy® GX and fed at a rate that supplied the same amount of protein to both treatment groups (0.20 g protein/kg BW/day). Horses were exercised at moderate intensity (65% of maximum heart rate) three times per week for weeks 1 – 4 and four times per week for weeks 5 – 8 on an Equi-Ciser. They were weighed and assigned body condition scores (BCS) at day 0, day 28, and day 56 of the study. At days 0 and 56, blood samples were taken prior to and during a graded exercise test (GXT) to exhaustion. Also on days 0 and 56, horses were assessed for rump fat thickness via ultrasound, assigned muscle mass scores by a blinded individual, and measured for forearm and gaskin circumference. ANOVA was done with mixed models and least squares means compared with Fisher's LSD. Significance was set at P<0.05.

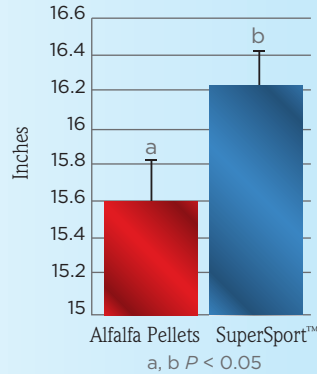
¹ Vineyard, K.R., M.E. Gordon, P. Graham-Thiers, and M. Jerina. 2013. Effects of daily administration of an amino acid-based supplement on muscle and exercise metabolism in working horses. Journal of Equine Veterinary Science, Vol 33(5).

FIGURE 1

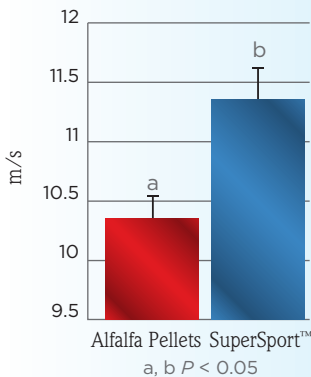
Fat-Free Mass in Horses Supplemented with Purina® SuperSport™ Supplement

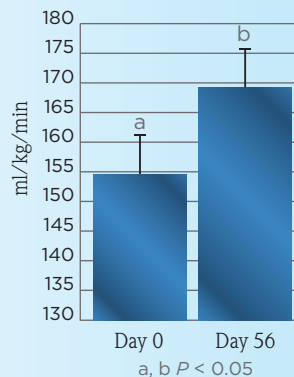
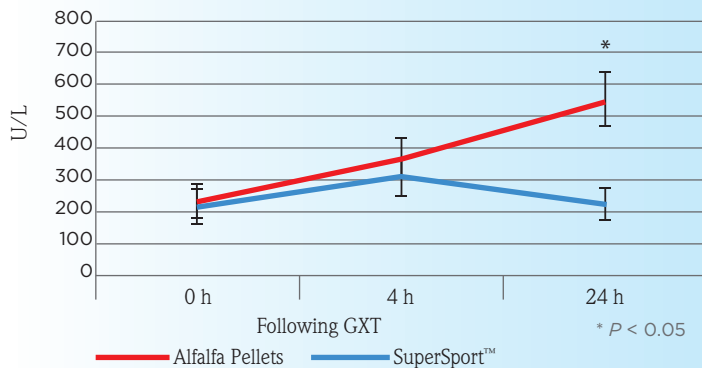

FIGURE 2

Forearm Muscle Circumference After 56 Days of Supplementation


FIGURE 3

Top Speed During GXT After 56 Days of Supplementation


FIGURE 4

 VO₂ Max in Horses Supplemented with Purina® SuperSport™ Supplement

FIGURE 5 Serum Creatine Kinase Following a Graded Exercise Test after 56 Days of Supplementation


< RESULTS >

Over the 56-day trial, BCS remained the same in both groups, but BW and rump fat decreased in horses supplemented with SS ($P < 0.05$). Fat-free mass, which is defined as all tissues in the body not composed of fat and includes muscle, bone, tendons, organs, and blood, increased in horses supplemented with SS but not AP ($P < 0.05$; Figure 1). Subjective muscle mass scores increased over time in both groups ($P < 0.05$). Forearm and gaskin circumference decreased in both groups over time ($P < 0.05$), but forearm circumference was higher in horses supplemented with SS than AP at day 56 ($P < 0.05$; Figure 2). During the GXT, top speed was greater in horses supplemented with SS versus AP at day 56 ($P < 0.05$; Figure 3). From day 0 to day 56, VO₂ max increased in horses supplemented with SS but not in AP ($P < 0.05$; Figure 4). On day 56 at 24-hours following the GXT, serum creatine kinase was lower in horses supplemented with SS than AP ($P < 0.05$; Figure 5) and serum AST was not different between treatment groups ($P < 0.05$). V_{L44} during the GXT increased from day 0 to day 56 in horses supplemented with SS ($P < 0.05$) but did not change in AP. There was a trend for maximum heart rate during the GXT to decrease from day 0 to day 56 in horses supplemented with SS and increase in horses supplemented with AP ($P < 0.10$). There was also a trend for time to fatigue to be greater in horses supplemented with SS than AP at day 56 ($P < 0.10$). At day 56, plasma glucose during the GXT was higher ($P < 0.05$) in SS than AP at every step until horses reached a speed of 11 m/s.

< IMPLICATIONS >

Daily supplementation of Purina® SuperSport™ Supplement resulted in rapid muscle recovery (lower levels of creatine kinase 24-hours after exercise), increased exercise capacity (improvements in VO₂ max, V_{L44}, maximum heart rate, and time to fatigue), and a shift to a more athletic body type (decreased body fat, increased fat-free mass, higher forearm circumference and improved muscle mass scores). Feeding Purina® SuperSport™ Supplement, which contains a significant proportion of high quality amino acids not typically supplemented in horse diets, had a positive impact on aspects of exercise metabolism, recovery, and muscle development and can benefit the hard-working equine athlete.

< FOR MORE INFORMATION >

Please contact your local Purina representative if you would like more information about this study.