

# Abstract

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## Effect of aspartate and asparagine supplementation on fatigue determinants in intense exercise.

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**PURPOSE:** This study evaluated the effect of aspartate (ASP) and asparagine (ASG) supplementation on fatigue determinants in Wistar rats exercised to exhaustion by swimming.

**METHODS:** The animals were tested for anaerobic threshold (AT) determination and then supplemented with 350 mM ASP + 400 mM ASG x day<sup>(-1)</sup> (AA group, n = 16) or 2 ml x day<sup>(-1)</sup> of distilled water (PLC group, n = 16) for 7 days. On the 7th day of supplementation, the animals were divided into 4 new groups and killed at rest (RAA, n = 8; RPLC, n = 8), or immediately after the swimming exercise to exhaustion (EAA, n = 8; EPLC, n = 8).

**RESULTS:** No significant differences were observed between amino acids and placebo rest groups for muscle and liver glycogen, blood glucose, lactate, alanine, and glutamine concentrations. However, in the exhaustion groups, the EAA group showed higher exercise time (68.37 +/- 25.42 x 41.12 +/- 13.82 min, p <.05) and lower blood lactate concentration (8.57 +/- 1.92 x 11.28 +/- 2.61 mmol x L<sup>(-1)</sup>, p <.05) than the EPLC group. Moreover, the ASP+ASG supplementation decreased the rate of glycogen degradation of gastrocnemius (1.00 +/- 0.51 x 3.43 +/- 0.99 microg x 100 mg of tissue sample<sup>(-1)</sup> x min<sup>(-1)</sup>), extensor digitorius longus (5.70 +/- 2.35 x 8.11 +/- 3.97 microg. 100 mg of tissue sample<sup>(-1)</sup> x min<sup>(-1)</sup>) and liver (0.51 +/- 0.34 x 3.37 +/- 2.31 microg x 100 mg of tissue sample<sup>(-1)</sup> x min<sup>(-1)</sup>) for EAA.

**CONCLUSION:** These results suggest that ASP+ASG supplementation may increase the contribution of oxidative metabolism in energy production and delay fatigue during exercise performed above the AT.

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