HYDROLYZED WHEY PROTEIN ENHANCES HEAT SHOCK PROTEIN (HSP70) IN SKELETAL MUSCLE OF RATS

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Whey proteins are rich in branched-chain amino acids that could participate in the endogenous synthesis of glutamine by the glutamine synthetase enzyme (GS). HSP70 confers greater cell tolerance and resistance against aggressor agents. The aim of the present study was to determine the effects of consuming whey proteins on HSP70 and GS. Forty-eight male Wistar rats were divided into a sedentary (S) group and an exercised (E) group and each group divided into 3 sub-groups according to the protein source: casein (CAS), whey protein (WP) and hydrolyzed whey protein (WPH). The feeding was conducted for 3 weeks of treatment. Results indicate that the consumption of WPH enhanced (100%) HSP70 expression in the skeletal muscles in the E group, while in the S group, there was very low HSP70 expression. The body temperature was elevated (8%) as a result of the exercise, regardless of the diet. Plasma free amino acids isoleucine, leucine and glutamate of S animals that consumed WPH, increased in comparison with those that consumed CAS. In addition, there were reductions in the valine, leucine and glutamate (glutamine precursors) in the animals of the WPH-exercised group. In association with the decrease in the concentration of glutamine precursors, there was an increase (30%) in the GS expression in the WPH group, suggesting probable use of amino acids precursors to synthesis of glutamine. The data suggest that consumption of WPH can enhances HSP70 and that GS could be involved in the mechanism of increasing HSP70 production.