EFFECTS OF DIETARY WHEY PROTEINS ON THE HSP70 EXPRESSION IN DIFFERENT TISSUES OF THE RAT

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Whey proteins have been recognized for their high nutritional value with a potential to protect from various kinds of stress. The heat shock protein HSP70 confers greater cell tolerance and resistance against aggressor agents and has been considered as an auxiliary antioxidant. The aim of the present study was to determine the effects of consuming whey proteins in the protein carbonyls and HSP70 expression in different tissues. Forty-eight male Wistar rats were first divided into a sedentary group (unstressed) and an exercised group (stressed), and each group further divided into 3 sub-groups according to the protein source based on the AIN93-G diet: casein (CAS), whey protein (WP) and hydrolyzed whey protein (WPH). The experiment was applied for 3 weeks of treatment with the experimental diets. HSP70 expression was measured by western blot and the concentration of protein carbonyls formed as a result of the action of reactive oxygen species (ROS), was determined by reaction with DNPH (2,4-dinitrophenylhydrazine). Results indicate that the consumption of WPH enhanced the HSP70 expression in the soleus (100%), gastrocnemius (66%) and lung (122%), but not in spleen, heart or kidney in the exercised group. While in the sedentary group (normal homeostasis), there was a very low or undetectable expression of HSP70, regardless of the diet or tissue. The plasma concentration of protein carbonyls decreased (26%) for the group that also consumed WPH. These results indicate that consumption of WPH enhances HSP70 production, but may help protect only certain tissues against the action of ROS.