

## Cardioprotective Effects of Grape Seed Extract against Lipo-toxicity and Energy Metabolism Alterations in High-Fat-Diet-Induced Obese Rats

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**Abstract :** Obesity is now a real public health issue throughout the world, and it is well-established that obesity leads to cardiovascular diseases. The prevention and treatment of obesity using nutritional supplements has become a realistic and effective approach. This study was carried out to analyze the incidence of a high-fat diet on rat heart metabolism as well as on fatty acids composition, then to investigate the eventual protective effects of a grape seed extract (GSE). The experimental design consisted of three rat groups subjected to three different conditions; standard (SD), high-fat diet (HFD) and HFD+GSE (HG). We showed that GSE counteracted the effect of HFD on fatty acid composition, namely, docosapentaenoic acid, docosahexaenoic acid, arachidonic acid (ARA), palmitic acid (PA) and palmitoleic acid. Besides, GSE treatment restored HFD-altered metabolic pathways through the recovery of some cardiac enzyme activities such as lipase, glucose 6 phosphate dehydrogenase and pyruvate dehydrogenase. The cardiac lactate level and lactate dehydrogenase activity were also analyzed in relation to HFD and GSE administration. To our knowledge, this is the first study showing the anti-obesity and cardioprotective effects of GSE in relation to fatty acid composition and some cardiac enzymes, supporting its role as a therapeutic agent of obesity.

**Keywords :** Grape seed extract, phenolic, obesity, cardioprotective, lipotoxicity, energy metabolism

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