Whey protein may cut metabolic risk of high-fat diet: Mouse study

By Stephen Daniells, 23-Mar-2011

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Whey protein isolate may slow weight gain and the accumulation of body fat when added to a high fat, suggest new findings from a study with mice.

Animals consuming a high fat diet supplemented with whey protein isolate (WPI) gained 42 percent less weight, and had 32 percent lower body weight than animals fed only the high fat diet, according to findings published in the *Journal of Nutrition*.

"In mice and humans, high fat diets contribute to the development of insulin resistance and hepatosteatosis, biomarkers and major risk factors for type-2 diabetes and non-alcoholic fatty liver disease (NAFLD)," wrote researchers from the University of Cincinnati and the University of Kentucky.

"In this study, WPI supplementation in mice reduced the severity of several biomarkers, including gain in body weight and adiposity, insulin resistance, and fatty liver," they added. *"[…] whey protein may have therapeutic potential to reduce the incidence of diabetes and fatty liver diseases, especially in at-risk individuals who consume excess energy and fat and lead a sedentary lifestyle."*

The whey forward

For a long time whey was viewed as a secondary product within the dairy industry, used simply as a means of feed for animals and not as an added-value ingredient. That, however, is changing, particularly with the impact of high milk costs on the industry.

Such a change has seen whey proteins become an important nutritional and functional food ingredient, with extensive use in food applications such as sport beverages, meat replacement products, baked products, salad dressings, ice creams, artificial coffee creams, soups and dairy products.

In addition to its extensive use in sports nutrition products, the new study suggests that whey protein may also reduce the risk of metabolic disease associated with a high fat diet.

Study details

Led by Howard Shertzer from the University of Cincinnati, the researchers fed mice a high fat diet for 11 weeks. The high fat diet was defined as providing 40 percent of calories from fat. Animals were subsequently randomly assigned to one of two groups: One groups received normal drinking water, while the other received drinking water containing 100 grams of whey protein isolate (Natural Pure WPI, Bioplex Nutrition) per liter.

In addition to the improvements in body weight and body fat levels in whey protein supplemented animals, compared with non-supplemented animals, the researchers also report that whey-fed animals also had 7.4 percent more lean body mass.

Benefits were also observed in analyses of the animals' liver showed that whey protein supplementation was associated with 50 percent of the lipid droplet and tissue lipid content of the high-fat only animals,

Dr Shertzer and his co-workers also report that the insulin concentrations of whey protein-fed animals were 29 percent of those recorded in the control animals.

"The protective effect of whey protein was consistent with higher basal metabolic rates and mitochondrial oxygen consumption and lower metabolic utilization of dietary lipid, leading to an overall lower feeding efficiency," wrote the researchers.

"Because the diets utilized in this study were not isonitrogenous, it is possible that supplementation with any protein would have been effective. Certainly, the active component(s) of whey responsible for these results have yet to be identified," they concluded.

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“Dietary whey protein lowers the risk for metabolic disease in mice fed a high-fat diet”
Authors: H.G. Shertzer, S.E. Woods, M. Krishan, M.B. Genter, K.J. Pearson