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## Anti insulin-resistance properties of milk whey protein hydrolyzates and peptides

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Physical exercise and a morning breakfast with whey protein digests may become a way to improve the metabolism of circulating glucose. Whey protein (WP) and whey protein hydrolyzate (WPH) have been recognized for their capacity to increase muscle glycogen stores. When both sedentary and exercised animals are fed diets containing either casein, WP or WPH for a few days, gastrocnemius GLUT-4, glycogen synthase and glycogen stores are increased, but the surge is greater with WPH than with WP. We have found that in addition to the positive effect of exercise, consumption of WPH significantly increases the concentrations of GLUT-4 in the cell membrane as well as the glycogen stores, whereas the GLUT-1 and serum insulin (serum amino acids and classical biochemical health markers) suffer no alteration. Similar effects are observed when some peptides and amino acids generated during digestion of the whey proteins are fed to the animal. Since these findings are also observed in sedentary animals, a possible application is suggested as a dietary mitigation for hyperglycemic patients who are impeded from doing physical exercise. The favorable effects shown by hydrolyzed whey protein on glucose transport into skeletal muscle cell should encourage other studies with the potential of both WP and WPH for the treatment or prevention of type II diabetes, a disease in which translocation of GLUT-4 to the plasma membrane is reduced.

### Biography

Jaime Amaya-Farfan is full Professor (retired), at the Food & Nutrition Dept., School of Food Engineering (FEA), of the University of Campinas, Brazil. He got his Bachelor's degree from Brandeis University, completed his Master's and Doctoral degrees at the University of Rhode Island, and held a Post-doctoral position at the University of Georgia Experiment Station. He was Department Chairman of the Food & Nutrition Dept. and occupied the Vice-Presidency and acting Presidency of the Brazilian Society of Food Science & Technology. For two terms, he was elected Coordinator of the Center for Food Security Studies (NEPA) of the University of Campinas and has been a Fellow of the International Academy of Food Science & Technology (IAFoST) since 2012. His area of expertise: Food processing and nutrition, with emphasis in protein nutrition and the role of hydrolyzed proteins as sources of bioactive peptides.

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