PISTACHIOS MAY CALM ACUTE STRESS REACTION

Penn State Study Fact Sheet

Washington, D.C. – Eating pistachios may reduce your body's response to the stresses of everyday life, according to a Penn State study.

"A ten-year follow-up study of young men showed that those who had larger cardiovascular responses to stress in the lab, were more likely to contract hypertension later in life," says Dr. Sheila G. West, associate professor of biobehavioral health. "Elevated reactions to stressors are partly genetic, but can be changed by diet and exercise. Lifestyle changes can make the biological reactions to stress smaller."

West and her colleagues investigated the effects of pistachios on standardized stressors on subjects who had high cholesterol, but normal blood pressure. They used a randomized, crossover controlled feeding study design and all three diets all contained the same number of calories. After a two-week run-in diet containing 35 percent fat and 11 percent saturated fats, each test diet lasted for four weeks during which time participants ate only foods supplied by the study. The researchers reported the results of this study at Experimental Biology 2007 today (April 30) in Washington, D.C.

The diets included a Step I Diet – a standard heart healthy diet with 25 percent fat and 8 percent saturated fat, a diet containing 1.5 ounces of pistachios that was a Step I Diet with 30 percent total fat and 8 percent saturated fat and a diet containing 3 ounces of pistachios that was a Step I Diet containing 34 percent fat and 8 percent saturated fat. At the end of each four-week diet regime, the researchers measured blood pressure and total peripheral vascular resistance at rest and during two stress tests.

The two tests consisted of a physical test and a psychological test. The physical test consists of putting one foot in a bucket of ice water for 2.5 minutes. The psychological test asks participants to listen to two numbers, add them in their head and say the answer. Then they hear another number and they must add it to the second number they heard, not the sum they spoke.

"The ice water is a stimulus for the sympathetic nervous system, but it is very different form the stressors we encounter every day," says West. "We also wanted to see if the reaction occurred when the stress was nonphysical, so we used the math test."

The researchers found that both pistachio containing diets reduced the stress effects on blood pressure, but that the 1.5 ounce pistachio diet reduced systolic blood pressure by 4.8 millimeters of mercury while the 3-ounce pistachio diet only reduced systolic blood pressure by 2.4 millimeters of mercury. The diets had no effect on normal, resting blood pressure.

"When we only look at blood pressure, these results are confusing," says West. "If it is the pistachios, why is it not dose related?"

When the researchers looked at total peripheral vascular resistance, it was clear that the 3-ounce diet caused greater relaxation of arteries. Because the body tightly regulates blood pressure, rather than allowing blood pressure to drop further, the heart compensated by pumping more forcefully.

"The relaxation of blood vessels after the 3-ounce pistachio diet likely reduced the workload on the heart," says West. "This pattern of change would be beneficial if it is maintained long term. It is possible that other foods that are high in unsaturated fat and antioxidants would have a similar effect."

Researchers on this study included West; Colin D. Kay, former Penn State post doctoral associate now at the University of East Anglia; Sarah K. Gebauer, graduate student in integrative biosciences; David M. Savastano, recent Ph.D. student in nutritional science now a postdoctoral fellow at NIH; Chris Diefenbach, undergraduate researcher now at New York University Medical School, and Penny Kris-Etherton, distinguished professor of nutritional sciences.