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Contact: Judy Hirigoyen
Director, Global Marketing
Cell: 916.580.5146
JHirigoyen@AmericanPistachios.org

Pistachios Shown to Help Reduce Blood Pressure and Biological Responses to Everyday Stress

New Findings on Pistachio Consumption Published in *Hypertension*

FRESNO, Calif., June 12, 2012--- A Pennsylvania State University study published online this month in *Hypertension*, an American Heart Association Journal, reveals that including pistachios in a healthy diet may positively reduce the body's response to the stresses of everyday life.

Adults with elevated cholesterol were enrolled in a randomized, controlled clinical trial comparing diets containing pistachios to a low fat diet. The results show that a healthy diet supplemented with pistachios helps decrease systolic blood pressure, peripheral vascular resistance and heart rate during acute stress. Cardiovascular responses were measured while participants engaged in a challenging mental arithmetic test and again as they immersed their foot in cold water.

The study conducted at Pennsylvania State University by Drs. Sheila G. West and Penny M. Kris-Etherton and colleagues examined how diets containing pistachios (one-and-a-half and three ounces per day) versus a low-fat diet without pistachios, affect responses to stress on subjects with elevated LDL cholesterol, but normal blood pressure. This study is the first to show that including both salted and unsalted pistachios in a healthy diet helps reduce blood pressure and lessen the vascular load on the heart.

The people in the study were healthy, non-smoking men and women with elevated LDL cholesterol (commonly regarded as bad cholesterol) but normal blood pressure. All of the meals

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were provided and calorie levels were customized to maintain body weight. Pistachios were substituted for other foods in the diet to prevent weight gain. Participants followed three different diets – one low fat diet (25% fat) without pistachios, and two with different levels of pistachios (approximately 1.5 oz or 10% of calories from pistachios and 3.0 oz or (20% of calories from pistachios). The pistachio diets contained higher amounts of potassium, healthy fats and protein. All diets were rich in fruit, vegetables, lean meats, and whole grains, consistent with current food-based dietary recommendations. Participant demographics and the diet design have been published previously.²

“Daily events, such as work stress, a tight deadline, or public speaking can increase blood pressure, and we know that we can’t avoid all of the stressors in our lives. These results are significant because they show that physiological responses to stress are affected by the foods we eat,” stated Sheila West, Ph.D., Associate Professor of Biobehavioral Health and the study’s lead author. Dr. West continues, “These changes in blood pressure occurred even though self-reported mood, anxiety, and tension were not changed.”

The largest drop in blood pressure, - 4.8 mm Hg, was associated with eating about one-and-a-half ounces of pistachios a day versus a -1.8 mm Hg on the low-fat diet and, -2.4 mm Hg, three ounces of pistachios per day. The diet containing three ounces of pistachios resulted in a significant decrease in peripheral vascular resistance, a measure of artery stiffness and heart rate versus the control diet. Fifty percent of the pistachios were given salted as a snack and the other half were unsalted and incorporated into recipes. Interestingly, although high sodium intake is typically associated with high blood pressure, the largest drop in in blood pressure was not associated with the lowest sodium diet. Pistachios do provide potassium (8% Daily Value) and magnesium (8% Daily Value) which are important in maintaining a healthy blood pressure.

“In addition, these results are very exciting because they demonstrate further benefits of pistachios on another risk factor for cardiovascular disease,” added Penny M. Kris-Etherton, Ph.D., R.D., Distinguished Professor of Nutrition, and a lead researcher for the study. Dr. Kris-Etherton adds, “Our previous research suggests including pistachios in a healthy diet lowers LDL cholesterol in a dose-response fashion² and increases antioxidants in the blood.³”

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“This research adds to the growing body of literature on the health benefits of pistachios,” added Constance J. Geiger, Ph.D., R.D. who serves as a nutrition research consultant with the American Pistachio Growers. Dr. Geiger continues, “Nuts, such as pistachios, are an important part of a healthy diet.”

For more information and to read the full study, go to hyper.ahajournals.org.¹

About the Study

The research support was provided by the Western Pistachio Association, now known as the American Pistachio Growers, with partial support from the NIH-supported General Clinical Research Center at Pennsylvania State University. It was first reported on in 2007. It is relevant because lowering blood pressure may reduce the risk for stroke and heart disease.

Pistachios Pack Powerful Nutrition

In recent years the U.S. Food and Drug Administration (FDA) recognized that tree nuts, including pistachios, may help reduce the risk of heart disease when eaten as part of a diet low in saturated fat and cholesterol. Since then, the American Pistachio Growers have committed to learning more about the nutritional benefits of pistachios and the nuts' impact on other health issues affecting Americans today.

Pistachio Facts

Pistachios are a naturally cholesterol-free and sodium-free snack that contains just 1.5 grams of saturated fat and 13 grams of fat per serving, the majority of which comes from monounsaturated and polyunsaturated fat. A one-ounce serving of pistachios equals 49 nuts, which is more nuts per serving than any other snack nut. One serving has as much potassium (290mg, 8 percent) as an orange (250 mg, 7 percent) and 3 g of fiber making it a nutritious snack choice or ingredient to incorporate into daily diets.

About American Pistachio Growers

American Pistachio Growers (APG) is a voluntary trade association representing members who are pistachio growers, processors and industry partners in California, Arizona

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and New Mexico. These states represent 100% of the domestic commercial pistachio production. APG pistachios are the “Official Snack” of both USA men’s and women’s water polo teams and Miss California. For more information, visit <http://www.AmericanPistachios.org>.

¹West SG, Gebauer SK, Kay CD, Bagshaw DM, Savastano DM, Diefenbach C, Kris-Etherton P. *Diets Containing Pistachios Reduce Systolic Blood Pressure and Peripheral Vascular Responses to Stress in Adults with Dyslipidemia. Hypertension.* 2012 Jun 4. [Epub ahead of print] doi:10.1161/HYPERTENSIONAHA.111.182147

²Gebauer SK, West SG, Kay CD, Alaupovic P, Bagshaw D, Kris-Etherton PM. “Effects of pistachios on cardiovascular disease risk factors and potential mechanisms of action: A dose-response study.” *Amer J Clin Nutr.* 2008;88:651–9.

³Kay CD, Gebauer SK, West SG, Kris-Etherton PM. “Pistachios increase serum antioxidants and lower serum oxidized-LDL in hypercholesterolemic adults.” *J Nutr.* 2010;140:1093-98.

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