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**VINEGAR HEALTH STUDIES**

**February 2010** Antiglycemic Properties of Vinegar in Healthy Adults
Dr. Carol Johnston of Arizona State University (ASU) has been researching the use of vinegar in treating Type II diabetes. Most recently, Dr. Johnston and colleagues published research in the January 2010 online issue of Annals of Nutrition and Metabolism, titled, "Examination of the Antiglycemic Properties of Vinegar in Healthy Adults." The researchers concluded that "The antiglycemic properties of vinegar are evident when small amounts of vinegar are ingested with meals composed of complex carbohydrates. In these situations, vinegar attenuated PPG (postprandial glycemia) by ~20% compared to placebo." In short, vinegar reduces PPG in healthy adults. Of note, the researchers state that taking steps to reduce PPG is recommended by the American Diabetes Association to limit complications of diabetes.

##### June 2009 **Vinegar May Prevent Build Up of Fat** According to foodnavigator-usa.com, a study published in the Journal of Agriculture and Food Chemistry found that animals fed a high-fat diet (50% of energy from fat) and supplemented with acetic acid at two different levels developed about 10 per cent less body fat than mice just eating the diet. The Japanese researchers, led by Tomoo Kondo from the Central Research Institute of the Mizkan Group Corporation, found that vinegar was working at a genetic level, by influencing genes linked to fatty acid oxidation and heat-generating (energy burning) proteins. According to the researchers, "The results of this study suggest that acetic acid suppresses body fat accumulation by increasing fatty oxidation and thermogenesis in the liver through PPAR-alpha.”

**Saltiness and Acidity (using vinegar): Detection and Recognition Thresholds and Their Interaction Near the Threshold**
In the recent issue of the Journal of Food Science (a publication of the Institute of Food Technologists (IFT)), a study was published titled, "Saltiness and Acidity: Detection and Recognition Thresholds and Their Interaction Near the Threshold." According to a recent IFT newsletter about the study, it was noted that vinegar may enhance saltiness and enable lower sodium content. The interaction of saltiness and acidity at the threshold level was studied with 35 to 40 young female panelists. As a first step, the detection and recognition thresholds of salt, rice vinegar and rice black vinegar were measured. Levels were then varied. The researchers found that both the detection and recognition thresholds of salt were decreased with the existence of the added vinegar ingredient. This tendency was more pronounced with rice black vinegar than with rice vinegar. However, no significant changes in the threshold of both detection and recognition were observed when salt at the half concentration of the detection threshold was added to rice vinegar. The researchers noted that was an interesting finding “since this breaks the symmetry of the enhancement/suppression between saltiness and acidity

##### December 2007 **Benefit of Vinegar Consumption in Patients with Type 2 Diabetes** Research was published in the November 2007 issue of Diabetes Care that demonstrated that vinegar ingestion at bedtime moderates waking glucose concentrations. The investigators at Arizona State University (ASU) found that the vinegar treatment was especially effective for the six subjects who had a typical fasting glucose greater than 7.2 mmol/L. Fasting glucose in these participants was reduced by 6 percent compared with a reduction of 0.7 percent in those with a typical fasting glucose less than 7.2 mmol/L. According to an article about the study, the researchers concluded, "Vinegar is widely available, it is affordable, and it is appealing as a remedy, but much more work is required to determine whether vinegar is a useful adjunct therapy for individuals with diabetes. “commonly believed.