

Common spices inhibit AGE



The June, 2008 issue of the *Journal of Medicinal Food* published a report by researchers at the University of Georgia which revealed that a number of common spices not only confer antioxidant benefits, but offer significant protection against the formation of advanced glycation end-products (AGE). Advanced glycation end-products are the result of the bonding of sugar with protein molecules, a process known as glycation, which increases when blood sugar levels are elevated. AGE compounds activate the immune system, leading to excessive inflammation and tissue damage. This damage can occur in the blood vessel walls, contributing to atherosclerosis.

For the current study, University of Georgia College of Family and Consumer

Sciences associate professor James Hargrove and colleagues prepared extracts of 24 herbs and spices purchased at a major supermarket. The extracts were tested for their phenolic content, antioxidant potential, and protein glycation inhibitory activity.

Cloves and cinnamon emerged as the leading spices in phenolic content among the extracts tested. (Phenols are plant compounds which have an antioxidant property.) The total phenolic content of cloves was found to be 30 percent of its dry weight, which is significantly higher than blueberries, a food that is known for its antioxidant and phenolic content. The team discovered a strong correlation between the extracts' phenol content and their ability to block AGE formation. Other extracts which significantly inhibited glycation were Jamaican allspice and apple pie spice, which is a blend of allspice, cinnamon and nutmeg. The remaining herbs and spices, including oregano, rosemary, and turmeric, also showed an ability to inhibit glycation, but at lesser dilutions.

"Because herbs and spices have a very low calorie content and are relatively inexpensive, they're a great way to get a lot of antioxidant and anti-inflammatory power into your diet," Dr Hargrove advised. "Culinary herbs and spices are all generally recognized as safe and have been time-tested in the diet. Indeed, some of spices and herbals are now sold as food supplements because of their recognized health benefits."

Study coauthor and UGA College of Pharmacy associate professor Diane Hartle added, "If you set up a good herb and spice cabinet and season your food liberally, you could double or even triple the medicinal value of your meal without increasing the caloric content."

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Diabetes

Glycation and oxidative stress are central to the damage caused by diabetes. Unfortunately, neither of them figures into conventional treatment for diabetes, which is generally concerned only with blood sugar control.

Glycation occurs when glucose reacts with protein, resulting in sugar-damaged proteins called advanced glycation end products (AGEs) (Kohn RR et al 1984; Monnier VM et al 1984). One well-known AGE among diabetics is glycated hemoglobin (HbA1c). HbA1c is created when glucose molecules bind to hemoglobin in the blood. Measuring HbA1c in the blood can help determine the overall exposure of

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