Red Delicious, Northern Spy Apples Have Most Antioxidants

Source: American Chemical Society

Some apples might do a better job of keeping the doctor away than others, according to Canadian researchers who analyzed eight popular varieties of the fruit. Red Delicious, Northern Spy and Ida Red, they say, pack a greater wallop of disease-fighting antioxidants than other apples studied.

The researchers, led by Rong Tsao, Ph.D., of Agriculture and Agri-Food Canada in Guelph, Ontario, also pinpointed the individual chemical compounds responsible for antioxidant activity in apples. The findings could lead to the breeding of hybrid apples that pack a heftier antioxidant punch.

The report appears in the June 29 issue of the American Chemical Society's peer-reviewed Journal of Agricultural and Food Chemistry. ACS is the world's largest scientific society.

Researchers have long known that apples are a good source of antioxidants, a group of chemicals that scavenge and neutralize unstable molecules called free radicals. Free radicals, which can wreak havoc on cells and tissues, appear to play a role in the onset of heart disease and prostate, colon and other cancers.

Polyphenols - phytochemicals that act like astringents - are major sources of antioxidants in apples, but which polyphenols are most active in the fruit has perplexed scientists. Tsao and his colleagues used three different laboratory measures to evaluate polyphenol activity in apples that are popular in Canada: Red Delicious, McIntosh, Cortland, Northern Spy, Ida Red, Golden Delicious, Mutsu and Empire apples. However, the researchers did not include a number of other apples popular in the United States including Gala, Granny Smith, Jonathan, York, Stayman and Rome. All of the apples used in the study were grown on the same farm under similar conditions.

The researchers found:

• Polyphenols were five times more prevalent in the skin than the flesh of the apples.

• Two polyphenols, epicatechin and procyanidin B2, were the greatest contributors to total antioxidant activity of the apples. Procyanidins accounted for about 60 percent of the antioxidant activity in the peel and 56 percent in the flesh.

• Red Delicious apples had two times more antioxidant activity than Empire apples, which had the least activity of any of the apples studied.

"When taste and texture do not matter, choosing an apple with a high proportion of polyphenols in the flesh and skin can potentially produce more-health benefits," Tsao said. "But eating any apple is better than eating no apple at all."

Elsewhere, three recent studies by researchers at Cornell University in New York offer plenty of other reasons to eat more apples:

• Alzheimer's disease. In rats, quercetin -- another potent antioxidant abundant in apples -- appears to protect brain cells against oxidative stress, a tissue-damaging process associated with Alzheimer's and other neurodegenerative disorders. This study was published in the December 1, 2004, issue of the Journal of Agriculture and Food Chemistry.

• Heart disease. Antioxidants found in apple extracts could potentially lower "bad" cholesterol (low density lipoprotein, or LDL) by stimulating the production of LDL receptors in the liver, which help remove...
cholesterol from the blood. This mechanism is similar to that of statin drugs, researchers say. In March, these findings were presented at the ACS national meeting in San Diego.

•**Breast cancer.** Rats exposed to a known carcinogen and then fed the human equivalent of one, three or six apples a day respectively over 24 weeks were up to 44 percent less likely to develop breast tumors. That study was published in the April 6, 2005, issue of the Journal of Agricultural and Food Chemistry.

The American Chemical Society is a nonprofit organization, chartered by the U.S. Congress, with a multidisciplinary membership of more than 158,000 chemists and chemical engineers. It publishes numerous scientific journals and databases, convenes major research conferences and provides educational, science policy and career programs in chemistry. Its main offices are in Washington, D.C., and Columbus, Ohio.