Flavonoid Database
An Antioxidant Showcase

Specific phytonutrients called flavonoids are thought to enhance selected biological functions in humans. Tea, oranges, and mint have high amounts of flavonoids.

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What do citrus, berries, onions, teas, and red wine have in common?

They all contain considerable amounts of specific phytonutrients called flavonoids. These foods and many others are included in a new supplemental database soon to be released by scientists from the Beltsville Human Nutrition Research Center (BHNRC) in Beltsville, Maryland. The center also developed and manages USDA's National Nutrient Database for Standard Reference, which is the major authoritative source of food composition information in the United States. Other specialty databases include those for carotenoids and isoflavones. These compilations may be found on the World Wide Web by going to www.nal.usda.gov/fnic/foodcomp.

Flavonoids make up the largest subgroup of phytonutrients or phytochemicals, now widely studied by the scientific community because of purported health benefits. Phytonutrients are beneficial compounds found in plant-based foods, including fruits, vegetables, nuts, seeds, roots, certain teas and wines, and even in some chocolate.

Work on the database began when ARS scientists with the Nutrient Data Laboratory (NDL) in Beltsville and the Jean Mayer USDA Human Nutrition Research Center on Aging at Tufts University in Boston, Massachusetts, undertook an extensive search of existing scientific literature and a review of information supplied by food producers. NDL researchers evaluated the existing flavonoid data and screened it with a USDA-developed data-quality-evaluation system. Then, a quality score was assigned to each value for each food.

"These 'confidence codes,' lettered A, B, C, or D, appear in a column alongside the values posted," says Joanne Holden, who heads the NDL. "This column gives users a handle on the quality of the data provided. By knowing the flavonoid content of foods, researchers can assess dietary intakes of flavonoids and perhaps one day identify relationships between those intakes and various chronic-disease risk factors."

Dietary flavonoids fall mainly into five subclasses: flavonols, flavones, flavanones, flavans, and anthocyanidins. A plant produces more flavonoids as a protective response when it undergoes stress, such as exposure to ultraviolet radiation or attack by fungi or bacteria. Increased flavonoid levels are thought to enhance certain biological functions in humans. Indeed, some flavonoids have antioxidative, antimicrobial, and possibly anticarcinogenic and cardioprotective effects.

Soon to be launched, the new ARS Flavonoid Database will provide analytical values for selected compounds in about 220 foods. An update will also appear containing new data on 59 food items that are now being analyzed by BHNRC's Food Composition Laboratory. Scientists there developed a new analytical method that simultaneously separates and measures the five major flavonoid classes. The samples of fruits, nuts, and vegetables used were collected as part of NDL's National Food and Nutrient Analysis Program, developed in collaboration with the National Institutes of Health to improve the quality and quantity of data in USDA's National Nutrient Database.—By **Rosalie Marion Bliss,** ARS.

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