

## Determination of flavonoids and phenolics and their distribution in almonds.

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### Abstract:

Limited information is available concerning the qualitative and quantitative composition of polyphenolic compounds, especially flavonoids, in almonds. We determined total phenols, flavonoids, and phenolic acids in California almond (*Prunus dulcis*) skins and kernels among the principal almond varieties (Butte, Carmel, Fritz, Mission, Monterey, Nonpareil, Padre, and Price) with high-performance liquid chromatography (HPLC)/electrochemical detection and UV detection. Liquid chromatography/tandem mass spectrometry under identical HPLC conditions was utilized to verify identities of the predominant flavonoids and phenolic acids. Total phenols ranged from 127 (Fritz) to 241 (Padre) mg gallic acid equivalents/100 g of fresh weight. The analyses were compiled to produce a data set of 18 flavonoids and three phenolic acids. The predominant flavonoids were isorhamnetin-3- O-rutinoside and isorhamnetin-3-O-glucoside (in combination), catechin, kaempferol-3-O-rutinoside, epicatechin, quercetin- 3- O-galactoside, and isorhamnetin-3- O-galactoside at 16.81, 1.93, 1.17, 0.85, 0.83, and 0.50 mg/100 g of fresh weight almonds, respectively. Using the existing approach of calculating only the aglycone form of flavonoids for use in the U.S. Department of Agriculture nutrient database, whole almonds would provide the most prevalent aglycones of isorhamnetin at 11.70 (3.32), kaempferol at 0.60 (0.17), catechin at 1.93 (0.55), quercetin at 0.72 (0.20), and epicatechin at 0.85 (0.24) mg/100 g of fresh weight (mg/oz serving), respectively. These data can lead to a better understanding of the mechanisms of action underlying the relationship between almond consumption and health-related outcomes and provide values for whole and blanched almonds suitable for inclusion in nutrient databases.