

Almond polyphenols: methods of analysis, contribution to food quality, and health promotion.

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Abstract:

Almond is a nutrient-dense tree nut recognized for its favorable lipid profile, vitamin E content, and polyphenols. The objectives of this review were to determine the polyphenols reported in almond, summarize the methods of analysis, and determine the polyphenol contribution to almond quality and health-promoting activity.

Approximately 130 different polyphenols have been identified in almond, although not all of these have been quantitated. The mean and 25% to 75% percentile contents reported in literature were 162 mg (67.1 to 257) proanthocyanidins (dimers or larger), 82.1 mg (72.9 to 91.5) hydrolysable tannins, 61.2 mg (13.0 to 93.8) flavonoids (non-isoflavone), 5.5mg (5.2 to 12) phenolic acids and aldehydes, and 0.7mg (0.5 to 0.9) isoflavones, stilbenes, and lignans per 100 g almond. Following solvent extraction of almond, hydrolysis of the residue liberates additional proanthocyanidins, phenolic acids and aldehydes, and total phenols. Blanching and skin removal consistently reduces almond polyphenol content, but blanch water and almond skins retain enough polyphenols to be used as antimicrobial and antioxidant ingredients. Roasting and pasteurization have inconsistent effects on almond polyphenols. Almond polyphenols contribute to shelf life by inhibiting lipid oxidation and providing pigmentation, flavor, astringency, and antimicrobial activity. The health-promoting activity of whole almonds has been widely investigated, but few have considered the contribution of polyphenols. Preclinical studies of polyphenol-rich almond skin or almond extracts suggest putative effects on antioxidant function, detoxification, antiviral activity, anti-inflammatory function, and topical use for inhibiting ultraviolet A damage. Therefore, almond has a diverse polyphenol profile contributing to both its food quality and health-promoting actions.

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