Flavonoid Content of Selected Foods – A Comparison of Four International Composition Tables

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Objectives: As part of the multinational Burden of Lung Disease (BOLD) survey, this study investigated the flavonoid content and agreement levels of foods included in BOLD's food frequency questionnaire (FFQ), using four international flavonoid composition tables.

Methods: The USDA (American), BioActive Substances in Food Information System (eBASIS; European), Indian Food Composition (IFCT), and Phenol-Explorer (European) Tables were selected for their comparable data on five subclasses of flavonoids (flavan-3-ols, flavanones, flavones, flavonols, and isoflavones). Flavonoid estimates were derived for all foods available in each table (n = 117 USDA; n = 77 eBASIS; n = 69 IFCT; n = 90 Phenol-Explorer), and comparisons were carried out for foods common between tables. Percentage differences of flavonoid content were calculated, and intraclass correlation coefficients (ICCs; 95% confidence intervals [95%CI]) estimated. ICC reliability was categorized as low (<0.5), moderate (0.50–0.75), good (0.75–0.90), or excellent (>0.90).

Results: Compared to the USDA Table, total flavonoid content was overestimated by 181.5%, 14.1%, and 26.5%, in the eBASIS, IFCT, and Phenol-Explorer tables, respectively. Compared to Phenol-Explorer, total flavonoid content was overestimated by 53.0% in eBASIS and by 29.6% in IFCT. The reliability for total flavonoid content between the USDA and Phenol-Explorer tables was moderate (ICC 0.51; 95% CI 0.33, 0.65), low between Phenol-Explorer and eBASIS (ICC 0.27; 95% CI 0.02, 0.49), and low between Phenol-Explorer and IFCT (ICC 0.22, 95%CI −0.07, 0.48). There was good-to-excellent reliability between USDA and Phenol-Explorer for flavanones and flavones (ICC 0.93; 95%CI 0.82, 0.98; and ICC 0.86; 95%CI 0.73, 0.93, respectively). Phenol-Explorer and IFCT showed good reliability for flavanone and flavanol subclasses. ICCs for other subclasses was low across tables.

Conclusions: Flavonoid estimates varied considerably across international tables. These differences should be taken into consideration when deriving flavonoid content in population-based surveys.

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