Dietary Intakes of Individual Flavanols and Flavonols Are Inversely Associated with Incident Type 2 Diabetes in European Populations

Dietary flavanols and flavonols, flavonoid subclasses, have been recently associated with a lower risk of type 2 diabetes (T2D) in Europe. Even within the same subclass, flavonoids may differ considerably in bioavailability and bioactivity. We aimed to examine the association between individual flavanol and flavonol intakes and risk of developing T2D across European countries. The European Prospective Investigation into Cancer and Nutrition (EPIC)–InterAct case-cohort study was conducted in 8 European countries across 26 study centers with 340,234 participants contributing 3.99 million person-years of follow-up, among whom 12,403 incident T2D cases were ascertained and a center-stratified subcohort of 16,154 individuals was defined. We estimated flavonoid intake at baseline from validated dietary questionnaires using a database developed from Phenol-Explorer and USDA databases. We used country-specific Prentice-weighted Cox regression models and random-effects meta-analysis methods to estimate HRs. Among the flavanol subclass, we observed significant inverse trends between intakes of all individual flavan-3-ol monomers and risk of T2D in multivariable models (all P-trend <0.05). We also observed significant trends for the intakes of proanthocyanidin dimers (HR for the highest vs. the lowest quintile: 0.81; 95% CI: 0.71, 0.92; P-trend = 0.003) and trimers (HR: 0.91; 95% CI: 0.80, 1.04; P-trend = 0.07) but not for proanthocyanidins with a greater polymerization degree. Among the flavonol subclass, myricetin (HR: 0.77; 95% CI: 0.64, 0.93; P-trend = 0.001) was associated with a lower incidence of T2D. This large and heterogeneous European study showed inverse associations between all individual flavan-3-ol monomers, proanthocyanidins with a low polymerization degree, and the flavonol myricetin and incident T2D. These results suggest that individual flavonoids have different roles in the etiology of T2D.

General information
State: Published
Organisations: National Food Institute, Division of Toxicology and Risk Assessment, University of Cambridge, Catalan Institute of Oncology, German Institute of Human Nutrition, CIBER Epidemiology and Public Health, University Medical Centre Utrecht, University of Paris-Sud - University of Paris XI, Lund University, University of Oxford, IRCCS Istituto Europeo di Oncologia - Milano, German Cancer Research Center (DKFZ), Cancer Research and Prevention Institute, University of Naples Federico II, Aarhus University, Centre for Research in Epidemiology and Population Health, Spanish National Health System, Human Genetic Foundation, Umeå University, International Agency for Research on Cancer, Danish Cancer Society, National Institute of Public Health and the Environment, 'Civile M.P. Arezzo' Hospital, Imperial College London, Wageningen University & Research
Pages: 335-343
Publication date: 2014
Peer-reviewed: Yes

Publication information
Journal: Journal of Nutrition
Volume: 144
Issue number: 3
ISSN (Print): 0022-3166
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 4.24 SJR 2.191 SNIP 1.395
Web of Science (2017): Impact factor 4.398
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.93 SJR 2.025 SNIP 1.336
Web of Science (2016): Impact factor 4.145
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 4.08 SJR 2.107 SNIP 1.517
Web of Science (2015): Impact factor 3.74
BFI (2014): BFI-level 2