Is Eating a Greater Diversity of Foods Associated with Lower Incidence of Type 2 Diabetes?: Prospective Analysis of the EPIC-InterAct Case-Cohort Study

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Objectives: Healthy eating includes a diverse diet as this ensures adequate amounts of various nutrients for different metabolic pathways. Dietary diversity may also improve survival and promote metabolic health. However, the impact of dietary diversity on type 2 diabetes (T2D) in heterogenous populations is unknown. We aimed to examine whether greater diversity in total diet and within food groups was related to T2D incidence in multi-country populations.

Methods: We evaluated baseline (1991-1998) self-reported diet data from 23,649 participants (including 10,363 incident events of T2D) from 8 European countries in the EPIC-InterAct study. Incident T2D by 2007 was verified with multiple sources, including objective records in each participating center. We constructed multiple scores for dietary diversity to assess: diversity between food groups (DDS-total5) (range: 0 to 5), and diversity of subtypes of vegetables (DDS-veg) (0 to 4), meats (DDS-meat) (0 to 6), animal protein (DDS-proA) (0 to 8) and plant protein (DDS-proP) (0 to 5). We fitted Prentice-weighted Cox regression to estimate hazard ratios (HR) and 95% confidence intervals (95% CI) by country and meta-analyzed the country-specific estimates.

Results: In multivariable-adjusted models, we found a significant association between total dietary diversity (all 5 food groups versus 3 or fewer) and incident T2D (HR 0.86 [95% CI: 0.75–0.98]). Similarly, within the vegetable group and within plant protein group, highest diversity scores were significantly inversely associated with incident T2D (0.90 [0.83–0.98] and 0.78 [0.65–0.93], respectively) compared to lowest scores. Both vegetable diversity and plant-protein diversity were robust to additional statistical adjustment, including food quantity, ratio of saturated to unsaturated fatty acids, prevalent non-communicable diseases and reproductive history. Conversely, greater diversity of animal-protein subtypes was associated with higher T2D incidence, in particular after adjusting for prevalent diseases (1.39 [1.21-1.59]).

Conclusions: This multi-country case-cohort study supports the consumption of diets comprising all 5 food groups as well as diversity of vegetable and plant-protein as a strategy to help prevent diabetes among a European population.