Background: Cognitive decline is of increasing concern in aging societies worldwide and could highlight a key time window for prevention of developing dementia. Evidence on food consumption in relation to cognitive decline remains unclear.

Methods: Consumption frequencies of common foods including vegetables, fruits, total fish (oily fish and non-oily fish), and total meat (processed meat, unprocessed red meat, and unprocessed poultry), were assessed via a 47-item food frequency questionnaire in 502,493 UK Biobank participants (mean age: 56.5 years; SD: 8.1; female: 54%) at recruitment in 2006–2010. Prevalent dementia cases (n=564) at baseline were excluded from analyses. Cognitive decline from baseline to follow-up 6–8 years later was characterised in five separate cognitive functions: visual memory (n=51,295), numeric memory (n=3131), fluid intelligence (n=16,122), reaction ability (n=52,929), and prospective memory (n=16,400). The cognitive change was estimated using a standardized multiple regression-based approach. Associations between food consumption at baseline and cognitive changes were fitted in logistic regression adjusting for age, gender, ethnicity, education, socioeconomic status, living region, smoking status, alcohol status, physical activity level, body mass index, sleep duration, stroke history, and family history of dementia; odds ratio (OR) and 95% confidence interval (CI) were reported.

Results: In this population-based cohort study, high fruit consumption was associated with increased odds of deteriorating visual memory (OR=1.04, 95%CI: 1.01, 1.06; P = 0.002), whereas high vegetable consumption was linked to increased odds of deteriorating prospective memory (OR=1.14, 95%CI: 1.07, 1.21; P < 0.001). Consumption of oily fish was associated with deteriorating visual memory in the total sample (OR=1.08, 95%CI: 1.04, 1.12; P < 0.001), but this was observed in women only (OR=1.08, 95%CI: 1.04, 1.12; P < 0.001). Consumption of total fish was associated with a decline in visual memory in the total sample (OR=1.05, 95%CI: 1.02, 1.08; P < 0.001) and in men (OR=1.05, 95%CI: 1.02, 1.09; P = 0.003), and a decline in reaction ability only in women (OR=1.05, 95%CI: 1.01, 1.09; P = 0.007). Meat consumption of any type was not related to cognitive decline in all five cognitive functions.

Conclusion: High consumption of vegetable, fruit and fish may be associated with increased risk of cognitive decline. One possible explanation is high consumption of fruits and vegetables may be associated with lower protein intakes. Animal protein has been associated with better cognitive performance. These findings need to be interpreted with caution and confirmed in other studies.