

Consumption of Red Meat Is Negatively Associated with Cognitive Function: A Cross-Sectional Analysis of UK Biobank

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Objectives: In the largest study of its type, we tested for associations between red meat consumption and cognitive function using data from half a million participants enrolled into the UK Biobank cohort study.

Methods: Baseline data was obtained from the UK Biobank cohort, comprising half a million participants aged 37–73 years recruited between 2006 and 2010. The intake of red meat (frequency per week) was obtained using a self-reported food frequency questionnaire. Cognitive tests included the reaction-time (RT) test (reaction ability, $N = 496,695$), fluid intelligence (FI) (reasoning ability, $N = 165,467$), the numeric memory test (short-term memory, $N = 50,364$), the pairs-matching (PM) test (visual-spatial memory, $N = 482,650$) and the prospective memory test ($N = 171,509$). Logistic and linear regression modelling was conducted with adjustment for potential confounders including age at recruitment, sex, ethnicity, Townsend deprivation index, smoking, alcohol, education, body mass index, physical activity level, sleeping hours, stroke history, and family history of dementia.

Results: Each additional portion per week of red-meat intake was associated with slower reaction time by 0.26 milliseconds (95% CI: 0.02, 0.50), lower FI score by 0.01 points ($-0.02, -0.00$), reduced numeric memory by 0.02 digits ($-0.03, -0.01$), and increased odds of incorrect prospective memory by 1% (0%, 2%). In men these associations were larger regarding the RT test ($\beta = 0.54, [0.21, 0.87]$), FI score ($\beta = -0.02, [-0.03, -0.01]$), and prospective memory (OR = 1.03, [1.01, 1.04]), while in women these were not significant. In terms of the PM test, a single additional portion of red-meat intake was associated with reduced incorrect matches by 0.004 pairs ($-0.003, -0.006$), both in men ($\beta = -0.003, [-0.001, -0.005]$) and women ($\beta = -0.006, [-0.004, -0.008]$).

Conclusions: In this cross-sectional analysis of the adult UK population, higher intake of red meat was associated with poorer cognitive function including reaction and reasoning ability, short-term and prospective memory especially among men; but not visual-spatial memory which showed a weak protective effect of red meat.

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