

## Vegetables But Not Fruit Said to Preserve the Aging Brain

By Crystal Phend, Staff Writer, MedPage Today

Reviewed by [Zalman S. Agus, MD; Emeritus Professor at the University of Pennsylvania School of Medicine.](#)

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CHICAGO, Oct. 24 -- Vegetables help older patients keep their wits about them, but fruit appears to have no effect on preventing cognitive decline, according to researchers here.

Two servings of vegetables a day averted the equivalent of five years of mental aging in people older than 65, by Martha Clare Morris, Sc.D., of Rush Medical Center here, and colleagues, reported in the Oct. 24 issue of *Neurology*.

Those who ate at least 2.8 servings of vegetables a day effectively slowed their rate of cognitive change by about 40% compared with those who consumed less than one serving a day (slower by 0.019 standardized units per year,  $P=0.01$ ), the investigators wrote.

For fruit, the cognitive decline rate difference between the higher and lower intake quintile groups "fluctuated around zero and became even smaller with further control for all other potential confounding variables," they wrote.

The difference in effect between vegetables and fruit may be the higher vitamin E content of vegetables, they added. Green leafy vegetables, which have the most vitamin E and were the most consumed category of vegetables, had the strongest linear association with lower rates of cognitive decline ( $P=0.03$  for linear trend). After controlling for vitamin E, the difference in decline rate between participants who ate the most vegetables and those who ate the least was no longer significant.

"Vegetables, but not fruits, are also typically consumed with added fats [such as] salad dressings, mayonnaise, margarine or butter, and fats increase the absorption of vitamin E and other fat soluble antioxidant nutrients," Dr. Morris and colleagues wrote.

The prospective cohort study, part of the Chicago Health and Aging Project, followed 3,718 participants 65 and older. The Chicago residents completed food-frequency questionnaires and cognitive assessments (the East Boston Tests of immediate memory and delayed recall, the Mini-Mental State Examination, and the Symbol Digit Modalities) at baseline and three and six years later.

The cohort available for analysis was 60% black and 62% female white with an average education level of 12.2 years. The overall mean change in cognitive score was a decline of 0.04 standardized units per year (SU/y). The analyzed cohort had higher mean cognitive scores (average 0.18, range -3.5 to 1.6) and slightly higher Mini-Mental State Examination scores (average 26.7) than the entire study population at

baseline.

Participants with high fruits and vegetables intakes tended to have a favorable risk profile for health and cognition. They were more likely to be female, white, more educated, and more physically active. The high fruit consumers were somewhat more likely to have a cardiovascular-related condition, including myocardial infarction, hypertension, and diabetes.

The average total daily intake of fruits and vegetables together was 4.5 servings per day. There was no association between this combined measure and change in cognitive score over six years even after adjusting for age and total energy intake ( $P=0.28$  for trend) or other factors.

The average vegetable intake was 2.3 servings per day. After adjustment for age and total energy intake, there was a "marginally" significant association of slower cognitive decline with higher intake ( $P=0.06$  for linear trend) that became strong after controlling for sex, race, education, cognitive activity, physical activity, and alcohol consumption ( $P=0.04$  for trend).

After adjusting for age, sex, race and education, the researchers reported:

The rate for persons in the fourth quintile (median 2.8 servings/day) was 0.019 standardized units per year slower than for those in the lowest (median 0.9 servings/day) intake quintile ( $P=0.01$ ),

The rate was 0.018 standardized units per year slower for participants in the for the fifth quintile (median, 4.1 servings/day) than the first quartile ( $P=0.02$ ), and

The association remained significant after further adjustment for cardiovascular-related conditions and risk factors ( $P=0.02$  for linear trend).

The association with vegetables was stronger among older participants. For each additional year of age, cognitive decline was more than 0.002 SU/year slower with vegetable intake of 2.1 servings per day or more (all  $P<0.03$ ). Separate analyses showed statistically significant inverse associations, for zucchini, summer squash, eggplant, broccoli, lettuce or tossed salad, and kale or collards.

The average daily fruit intake averaged 2.2 servings. The cognitive decline rates did not differ significantly among the five fruit intake quintiles.

The researchers said their findings were consistent with those of the Nurses' Health Study, which followed cognitive decline for two years. They noted that a limitation of the study was a number of participants did not have dietary assessments and cognitive tests taken at the same time.

In addition, they pointed out that in an observational study it is always possible that the observed associations are due to residual or unmeasured confounding.

Previous studies have indicated relationships between individual dietary components, such as vitamin E, and age-related cognitive change. However, demonstrating the benefit of one group of food over another may be more useful to clinicians in counseling patients.

"The message to consume more or less of a food group is much simpler than the message to consume more or less of individual nutrients, which vary from food to food," the researchers said.

The study was supported by the National Institute on Aging.

### **Action Points**

Explain to interested patients that this study found a healthy diet with adequate vegetable intake was associated with a lower rate of cognitive decline with aging.

Point out that this is an observational study and cannot prove causality.

Note that the FDA's Dietary Guidelines for Americans recommends the equivalent of four to 13 servings a day of vegetables and fruit in a typical 2,000 calorie diet.

Primary source: Neurology

Source reference:

Morris MC, et al ["Associations of vegetable and fruit consumption with age-related cognitive change"](#)  
*Neurology* 2006; 67:1370-1376.