

## PREVENTION

# The healthy diet — fruits, vegetables, legumes, and fats

High intake of dietary fat is associated with a reduced risk of death, whereas high consumption of carbohydrates is associated with increased mortality, according to results from the PURE study presented at the ESC Congress 2017. Data from this large dietary study also show that fruit, vegetable, and legume intake is associated with a reduced risk of death, even if consumed at fairly moderate amounts. “Dietary guidelines should be reconsidered in light of these findings, especially in low-income and middle-income countries,” says study investigator Mahshid Dehghan.

Current dietary guidelines are based mostly on studies from Western countries where, for example, intake of fat was very high. Whether results from those studies can be extrapolated to other countries is unclear. The PURE study included >135,000 participants, aged 35–70 years, from 18 low-income, middle-income, and high-income countries across five continents and had 7.4 years of follow-up. Dietary intake was recorded using country-specific, validated food frequency questionnaires.

Participants with a high intake of fat (~35% of energy) had a 23% lower risk of death compared with the low-intake group (~11% of energy;  $P < 0.0001$ ). High intake of all major types of fat (saturated, monounsaturated, and polyunsaturated fat) was associated with significantly lower risk of death, and high intake of saturated fat was also associated with a 21% lower risk of stroke ( $P = 0.0498$ ). By contrast, a diet high in carbohydrates (~77% of energy) was associated with a 28% increased risk of death compared with a diet low in carbohydrates (~46% of energy;  $P = 0.0001$ ). No associations were found between fat or carbohydrate intake and risk of cardiovascular death.

High intake of total fat and each type of fat was associated with higher levels of total and LDL cholesterol, but also with increased HDL-cholesterol and apolipoprotein A1 levels and lower triglyceride levels. Reducing saturated fat intake and replacing it with carbohydrates had an adverse effect on blood lipid markers, whereas replacement of saturated with unsaturated fats

improved risk markers such as LDL-cholesterol level and blood pressure, but worsened HDL-cholesterol and triglyceride levels. These results contrast with current recommendations of limiting total and saturated fat intake to <30% and <10% of energy, respectively. “Relaxing current restrictions on fat consumption, while emphasizing limiting carbohydrate consumption (when high) is likely to reduce mortality,” says Dehghan.

The PURE study also showed an inverse association between fruit, vegetable, and legume intake and all-cause mortality, and specifically that participants who consumed three to four servings (375–500 g) daily had the lowest mortality compared with the group with less than one serving daily (HR 0.78, 95% CI 0.69–0.88), with little additional benefit for intake beyond this range. Most guidelines recommend a minimum of five daily servings.

“The current recommendation is unaffordable for most people in low-income and middle-income countries,” explains study investigator Victoria Miller. “Even a small reduction in the WHO’s recommendation from 400 g to 375 g per day may have important implications on food security in poor countries.” Of note, raw vegetable intake was more strongly associated with a lower risk of death than cooked vegetable intake.

Future work is planned to look at the effect of individual foods and dietary patterns on health outcomes. “As more data accumulate with increased follow-up and the expansion of enrolment in the PURE study, we will be in a better position to conduct more robust analyses of the associations between diet and specific causes of mortality,” says Miller.

Irene Fernández-Ruiz

**ORIGINAL ARTICLES** Dehghan, M. et al. Associations of fats and carbohydrate intake with cardiovascular disease and mortality in 18 countries from five continents (PURE): a prospective cohort study. *Lancet* [http://dx.doi.org/10.1016/S0140-6736\(17\)32252-3](http://dx.doi.org/10.1016/S0140-6736(17)32252-3) (2017) | Mente, A. et al. Association of dietary nutrients with blood lipids and blood pressure in 18 countries: a cross-sectional analysis from the PURE study. *Lancet Diabetes Endocrinol.* [http://dx.doi.org/10.1016/S2213-8587\(17\)30283-8](http://dx.doi.org/10.1016/S2213-8587(17)30283-8) (2017) | Miller, V. et al. Fruit, vegetable, and legume intake, and cardiovascular disease and deaths in 18 countries (PURE): a prospective cohort study. *Lancet* [http://dx.doi.org/10.1016/S0140-6736\(17\)32253-5](http://dx.doi.org/10.1016/S0140-6736(17)32253-5) (2017)

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