

Association of dairy intake with cardiovascular disease and mortality in 21 countries from five continents (PURE): a prospective cohort study

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Summary

Background Dietary guidelines recommend minimising consumption of whole-fat dairy products, as they are a source of saturated fats and presumed to adversely affect blood lipids and increase cardiovascular disease and mortality. Evidence for this contention is sparse and few data for the effects of dairy consumption on health are available from low-income and middle-income countries. Therefore, we aimed to assess the associations between total dairy and specific types of dairy products with mortality and major cardiovascular disease.

Methods The Prospective Urban Rural Epidemiology (PURE) study is a large multinational cohort study of individuals aged 35–70 years enrolled from 21 countries in five continents. Dietary intakes of dairy products for 136 384 individuals were recorded using country-specific validated food frequency questionnaires. Dairy products comprised milk, yoghurt, and cheese. We further grouped these foods into whole-fat and low-fat dairy. The primary outcome was the composite of mortality or major cardiovascular events (defined as death from cardiovascular causes, non-fatal myocardial infarction, stroke, or heart failure). Hazard ratios (HRs) were calculated using multivariable Cox frailty models with random intercepts to account for clustering of participants by centre.

Findings Between Jan 1, 2003, and July 14, 2018, we recorded 10 567 composite events (deaths [n=6796] or major cardiovascular events [n=5855]) during the 9.1 years of follow-up. Higher intake of total dairy (>2 servings per day compared with no intake) was associated with a lower risk of the composite outcome (HR 0.84, 95% CI 0.75–0.94; $p_{\text{trend}}=0.0004$), total mortality (0.83, 0.72–0.96; $p_{\text{trend}}=0.0052$), non-cardiovascular mortality (0.86, 0.72–1.02; $p_{\text{trend}}=0.046$), cardiovascular mortality (0.77, 0.58–1.01; $p_{\text{trend}}=0.029$), major cardiovascular disease (0.78, 0.67–0.90; $p_{\text{trend}}=0.0001$), and stroke (0.66, 0.53–0.82; $p_{\text{trend}}=0.0003$). No significant association with myocardial infarction was observed (HR 0.89, 95% CI 0.71–1.11; $p_{\text{trend}}=0.163$). Higher intake (>1 serving vs no intake) of milk (HR 0.90, 95% CI 0.82–0.99; $p_{\text{trend}}=0.0529$) and yogurt (0.86, 0.75–0.99; $p_{\text{trend}}=0.0051$) was associated with lower risk of the composite outcome, whereas cheese intake was not significantly associated with the composite outcome (0.88, 0.76–1.02; $p_{\text{trend}}=0.1399$). Butter intake was low and was not significantly associated with clinical outcomes (HR 1.09, 95% CI 0.90–1.33; $p_{\text{trend}}=0.4113$).

Interpretation Dairy consumption was associated with lower risk of mortality and major cardiovascular disease events in a diverse multinational cohort.

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