

Consuming alcohol as part of a meal is associated with lower risk of Coronary Heart Disease in a UK cohort

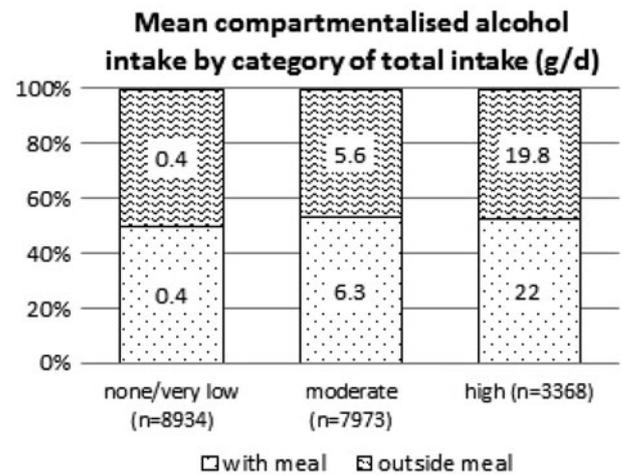
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Moderate alcohol intake has been found to be protective for coronary heart disease (CHD) in many population-based studies⁽¹⁾. In the European Prospective Investigation into Cancer and Nutrition (EPIC), alcohol intake patterns vary widely across participating centres^(2,3) and it remains uncertain how these patterns relate to CHD risk. We assessed how 'with meal' and 'outside meal' alcohol consumption were associated with CHD incidence in EPIC-Norfolk.

Participants completed a health and lifestyle questionnaire and attended a health examination between 1993 and 1998 (*n* = 25,639). Trained nurses gave instructions regarding 7-day diet diary (7dDD) completion. Only participants who returned a complete 7dDD, who had complete covariable data and who did not report a history of stroke, heart attack or cancer at baseline were included (*n* = 20,274). Alcohol intake was compartmentalised into 'with meal' when consumed with any of the following foods: meat, fish, eggs, potatoes, vegetables, cereals or soup; or, 'outside meal' if none of these foods were consumed at time of alcohol consumption. The recommended amount of alcoholic beverages (units/d) were used to create a 'moderate' (≤ 2.5 for women; ≤ 3.5 for men) and 'high consumer' group (> 2.5 and > 3.5 respectively); because of unavoidable misclassification in identifying non-alcohol consumers in a 7dDD, we considered this group together with participants reporting an alcohol intake of < 0.5 unit/d into one 'none/very low' category. Cox regression was used to assess the relative risk (hazard ratio, HR) of total and compartmentalised alcohol for CHD (2712 events over a median follow-up of 12 years), adjusted for sex, age, body mass index, smoking, education, social class, total energy intake and physical activity.

Among moderate and high consumers, the proportion of alcohol taken 'with meal' was similar (*P* = 0.38). Total and 'with meal' alcohol intake were negatively associated with CHD; however, 'outside meal' alcohol consumed above the recommended intake was associated with increased CHD. As a third model, which contained moderate and high consumers only (*n* = 11,340, 1387 events), we substituted 1 unit of 'outside meal' for 'with meal' alcohol whilst keeping total alcohol constant. 'With meal' alcohol was associated



| Models maximally adjusted | | Categories of alcohol intake | | | | | | |
|---------------------------|---------------|------------------------------|-------------|------------|------------------|---------|------------|--------------|
| | | None/very low HR | Moderate HR | 95% CI | <i>P</i> | High HR | 95% CI | <i>P</i> |
| 1 | Total alcohol | 1.00 (Ref) | 0.88 | 0.81, 0.96 | 0.004 | 0.89 | 0.79, 1.00 | 0.05 |
| 2 | With meal | 1.00 (Ref) | 0.83 | 0.76, 0.91 | <0.001 | 0.75 | 0.62, 0.90 | 0.002 |
| | Outside meal | 1.00 (Ref) | 1.00 | 0.91, 1.09 | 0.98 | 1.29 | 1.09, 1.53 | 0.003 |

with a lower CHD risk of 0.91 (95% CI: 0.87, 0.95).

In this UK cohort, alcohol consumed with a meal was associated with lower CHD risk, whereas high consumption of 'outside meal' alcohol was associated with increased CHD risk. Possible explanations include different choices of alcoholic beverages and/or foods, portion of alcohol per drinking occasion and differences in the time it takes to metabolise alcohol.

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