焦點議題 Focus Issues

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Exploring The Potential Causal Impact of Dietary Factors on Prostate Cancer Risk: A Two-Sample Mendelian Randomization Study

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[Abstract] Objective: Conventional observational research has indicated a link between dietary factors and prostate cancer (PCa), yet the impact of confounding factors on this association remains uncertain. The aim of this study was to investigate the potential causal relationship between dietary factors and PCa using the Mendelian randomization (MR) approach. Methods: We examined the potential causal association between dietary factors and PCa by employing a two-sample MR approach. In this study, summary statistics from genome-wide association studies (GWAS) on dietary factors and PCa were extracted from the UK Biobank and FinnGen databases. Six different MR analysis methods were employed to explore the correlation between dietary factors and PCa. The main analytical method is the inverse variance weighted (IVW) method. Meanwhile, we used MR-Egger regression, Cochran's Q test, the MR-Pleiotropy RESidual Sum and Outlier (MR-PRESSO) test, and the leave-one-out method to assess the robustness of the MR results. Results: The results of this study showed that the average weekly beer plus cider intake (OR=3.305, p=0.040) and oily fish intake (OR=1.877, p=0.012) were correlated with an increased likelihood of developing PCa, while green tea intake was negatively associated with the risk of PCa (OR=0.985, p=0.014). There was no significant direct causal relationship between other dietary factors and PCa in this study. Conclusion: This study found that increasing the average weekly beer plus cider intake and oily fish intake may increase the risk of PCa, while increasing green tea intake may reduce the risk of PCa. The results of this study can provide a reference for optimizing dietary intervention measures in the fields of public health and nursing and assist in the prevention of PCa.

[Key Words] dietary factors prostate cancer causal relationship Mendelian randomization

探索飲食因素對前列腺癌風險的潛在因果影響：一項雙樣本孟德爾隨機化研究

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【摘要】目的：傳統的觀察性研究表明飲食因素與前列腺癌（PCa）之間存在聯繫，但混雜因素對這種關聯的影響仍不確定。本研究旨在利用孟德爾隨機化方法（MR）調查飲食與 PCa 之間的潛在因果關係。方法：我們使用雙樣本 MR 方法研究了飲食因素與 PCa 之間的潛在因果關係。本研究從英國生物銀行和 FinnGen 數據庫中提取的有關飲食因素和 PCa 的全基因組關聯研究（GWAS）的總體統計數據。我們使用了六種不同的 MR 分析方法探討飲食因素與 PCa 之間的相關性。主要分析方法為逆方差加權法（IVW）。同時，我們使用 MR-Egger 回歸、Cochran's Q 檢驗和 MR-PRESSO 檢驗和留一法來評估 MR 結果的穩健性。結果：本研究結果顯示，平均每週啤酒加蘋果酒攝入量（OR=3.305，p=0.040）和油性魚攝入量（OR=1.877，p=0.012）與罹患 PCa 的可能性增加相關，而綠茶攝入量與 PCa 風險呈負相關（OR=0.985，p=0.014）。本研究中其他飲食因素與 PCa 之間沒有顯著的直接因果關係。結論：本研究發現，增加平均每週啤酒加蘋果酒攝入量和油性魚攝入量可能會增加 PCa 的風險，而增加綠茶攝入量可能會降低 PCa 的風險。本研究結果可為公共衛生及護理領域優化飲食干預措施提供參考，助力前列腺癌的預防工作。

【關鍵詞】 飲食因素 前列腺癌 因果關係 孟德爾隨機化

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1 Introduction

Prostate cancer (PCa) ranks as the second most prevalent solid tumor in men globally and is considered the fifth most significant contributor to cancer-related mortality (Sung et al., 2020). Due to the increasing rates at which the global population continues to age, it is projected that the global burden of PCa will surge, with an estimated 2.3 million new cases and 740,000 fatalities projected by the year 2040 (Culp et al., 2020). The prevalence and death rates associated with PCa continue to increase, making it one of the public health issues affecting men's health in contemporary society.

As dietary factors are modifiable risk factors, they may play a major role in the development and mitigation of PCa. Many researchers have focused on the potential impact of diet on PCa. Early research has indicated that adhering to the Mediterranean diet can lower the likelihood of developing PCa. This dietary pattern involves reducing the intake of animal fats and red meat while increasing the intake of plant-based foods (Marino et al., 2024). Moreover, specific dietary patterns have been linked to an increased likelihood of PCa. Such as the Western diet, which is defined by an excessive intake of processed meat and high-fat meat products, coupled with low levels of fruit and vegetable intake, and has been recognized as a contributing factor to this disease (Oczkowski et al., 2021; Shin et al., 2018). Some studies on dietary intakes and PCa have indicated that consuming dairy products, red meat, and processed meats could potentially raise the likelihood of developing PCa (Grosso et al., 2022; Nouri-Majd et al., 2022; Orlich et al., 2022; Zhao et al., 2023). However, the results of existing studies are contradictory, and no clear association between red meat intake and PCa risk was observed (Diallo et al., 2018). These studies may have been influenced by confounding factors, such as environmental influences, and were unable to set up a definitive causal link between dietary factors and PCa. Consequently, further research using the Mendelian randomization (MR) research approach is warranted.

The MR research approach has become increasingly important in genetic epidemiological research in recent years. It is a valuable method for making causal inferences. This method assesses the causal associations between exposure factors and clinical outcomes by utilizing single nucleotide polymorphisms (SNPs) as instrumental variables (IVs) (Larsson, 2021). The MR approach to research is based on the premise of randomly assigning individual genotypes based on the genotypes of the parents at the time of conception, similar to the random assignment principle of a randomized controlled trial (RCT), where individuals are randomized at birth to carry or not to carry genetic variants associated with exposure factors, independent of confounders such as the external environment and social behaviors (Wehby et al., 2008). Therefore, compared with RCT, the MR research method can reduce the impact of reverse causality and confounding factors to a certain extent, thereby increasing the reliability of inferences about associations between exposure factors and clinical outcomes. Currently, the MR research method has been utilized to explore the correlation between diet and a range of health conditions, including inflammatory bowel diseases, asthma, migraine, and lung cancer (Chen et al., 2022; Liu et al., 2023; Yan et al., 2023; Yang et al., 2023). However, little research has been conducted on the correlation between dietary factors and PCa. A comprehensive understanding of the influence of dietary factors on the risk of PCa is essential for developing more effective prevention strategies. Therefore, this study employed a two-sample Mendelian randomization (TSMR) research method to explore the correlation between dietary factors and PCa risk. Although existing observational studies have revealed the correlation between dietary factors and PCa, the interference of confounding factors has limited its clinical guidance value. Causal inference studies based on genetic instrumental variables can provide high-level evidence support for the formulation of evidence-based nursing guidelines and differentiated dietary guidelines or intervention plans can be formulated for high-risk groups (such as men with PCa susceptibility genes) in nursing practice. This personalized nutritional advice based on genetic background may be more effective than universal dietary advice in achieving primary prevention of PCa.

2 Materials and Methods

2.1 Study Design

This was a TSMR study. SNPs for dietary factors and PCa were derived from large genome-wide association studies (GWAS) databases. MR requires three key assumptions for instrument variables (IVs): (i) The relevance assumption posits that IVs should exhibit a strong correlation with dietary factors. (ii) The independence assumption suggests that IVs should not be linked to any potential confounding variables. (iii) The exclusivity assumption states that IVs should impact PCa solely through their influence on dietary factors and not through any other pathways. (Figure 1) (Sekula et al., 2016). Figure 2 illustrates the flowchart of this research design.

2.2 Data Sources

A cohort study at the UK Biobank provided data on genetic variation in 23 dietary factors and included half a million UK participants (Rusk, 2018). 23 different dietary factors served as exposure factors. The study included 23 different dietary factors: beverage intake (alcohol frequency, fortified wine, red wine, champagne plus white wine, spirits, beer plus cider, tea, green tea, and coffee), meat intake (processed meat, poultry, beef, pork, and lamb/mutton), fish intake (oily fish and non-oily fish), staple food intake (bread and cereals), vegetable intake (cooked vegetables and salads/raw vegetables), fruit intake (fresh fruit and dried fruit), and dairy intake (cheese). The UK Biobank surveyed participants about the frequency of relevant dietary patterns using an online questionnaire. The questionnaire inquired about participants' food intake, for example, regarding the frequency of intake-processed meats such as bacon, ham, sausages, hamburgers, chicken nuggets, and so on. Participants were asked to think about their food intake in the previous year and provide an average estimate.

Data on genetic variation in PCa was obtained from the FinnGen consortium and included 500,000 individuals in Finland (Kurki et al., 2023). The data on PCa included 6,311 cases and 74,685 controls.

Supplementary Table S2 presents information on the questionnaire investigating the intake of 23 foods and the diagnostic criteria for PCa. The relevant original research for this study has obtained ethical approval from the UK Biobank and FinnGen consortium, and all subjects signed informed consent forms. In this study, we obtained summary data from 23 different dietary factors and PCa GWAS through the IEU Open GWAS project platform (accessed on October 15, 2023; https://gwas.mrcieu.ac.uk/). As the summary data are public and anonymous, no further ethical approval was required.

2.3 Selection of IVs

Before using the TSMR method to analyze the causal association between dietary factors and PCa, a seven-step process was undertaken to identify appropriate IVs.

(1) To meet the first assumption of relevance, SNPs were used as IVs, and the SNPs were significantly linked to the exposure factors with a *p*-value less than 5×10^{-8}.

(2) In order to guarantee the chosen IVs' independence from one another, a linkage disequilibrium (LD) test was required. For the LD clumping process, the r2 threshold was set to 0.001, and the clustering window size was set to 10000 kb (Sved & Hill, 2018).

(3) To satisfy the independence assumption, the PhenoScanner V2 database (accessed on October 20, 2023; http://www.phenoscanner.medschl.cam.ac.uk/) was used to query the phenotypes of SNPs to

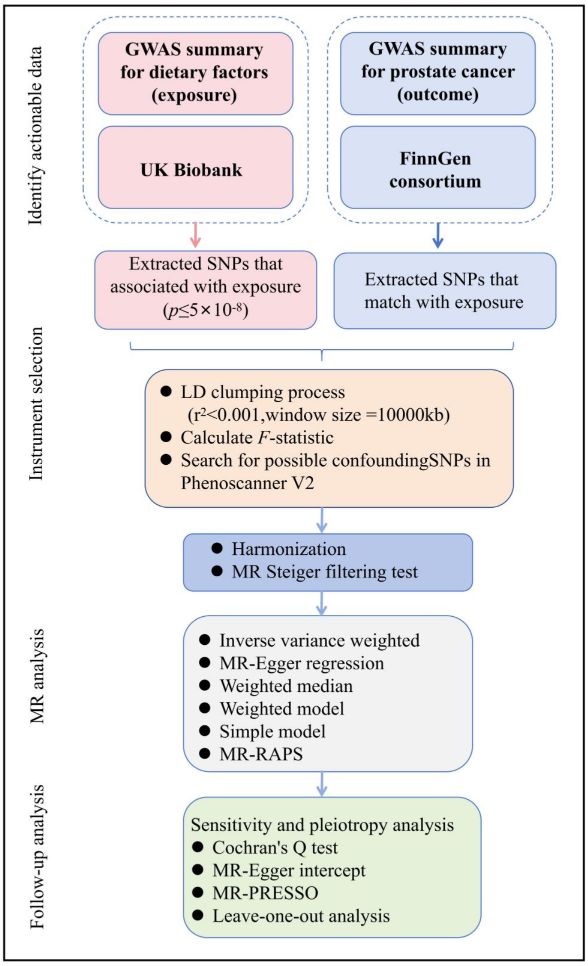


Figure 1 The flow chart of this study design
Abbreviations: GWAS, genome-wide association studies; LD, linkage disequilibrium; MR, Mendelian randomization; MR-Egger regression, Mendelian randomized Egger regression; MR-PRESSO, Mendelian randomization Pleiotropy RESidual Sum and Outlier; MR-RAPS, Mendelian randomization robust adjusted profile score; SNPs, single nucleotide polymorphisms.

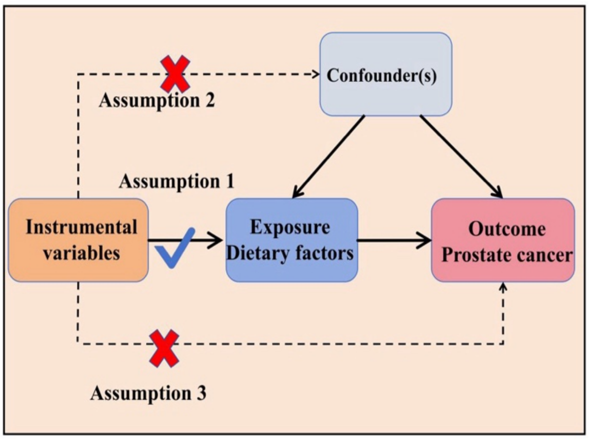


Figure 2 MR requires three key assumptions for instrumental variables
Abbreviations: Assumption 1, Relevance assumption; Assumption 2, Independence assumption; Assumption 3, Exclusion assumption.

identify potential pleiotropic confounders (Kamat et al. 2019). SNPs associated with confounders were removed, including smoking and body mass index (Supplementary Table S4) (Bergengren et al., 2023). At the same time, genetic variants directly associated with PCa were removed to comply with the exclusivity assumption, and selected SNPs cannot be directly associated with the outcome. In addition, we also removed SNPs that were duplicated between dietary factors to reduce possible pleiotropy between SNPs (Supplementary Table S5).

(4) In this study, R^2 and F-statistic were calculated for each SNP. R^2 was used to assess the extent of the difference in exposure explained by genetic variation. The calculation formula for R^2 is $R^2=\frac{2\times EAF\times(1-EAF)\times beta^2}{[(2\times EAF\times(1-EAF)\times beta^2)+(2\times EAF\times(1-EAF)\times N\times SE(beta)^2)]}$, in this formula, beta stands for the effect size of a single specific SNP, EAF stands for effect allele frequency, and SE stands for a standard error for beta. We used the F-statistic to evaluate the strength of the association between each IV and the exposure factor. A SNP with F-statistic less than 10 was considered to be affected by weak IV bias, and the SNP was deleted (Burgess et al., 2011). The calculation formula for F-statistic is $F=\frac{R^2}{1-R^2}\times\frac{N-K-1}{K}$, in this formula, the R^2 stands for the variance in the exposure explained by the genetic variants, the K denotes the quantity of SNPs, and the N represents the sample size of the GWAS pertaining to the exposure factor.

(5) When looking for SNPs from the results, we did not use proxy SNPs because the FinnGen consortium contains sufficient SNPs (16,377,987 SNPs in the PCa data).

(6) We employed the MR Steiger filter test to evaluate the causal direction, judge whether the directionality of a single SNP is correct, and remove the SNP with "FALSE" in the MR Steiger filter test results (Supplementary Table S7) (Hemani et al., 2017).

(7) After harmonizing exposure and outcome data, SNPs with "A/T" or "G/C" alleles were defined as palindromic SNPs, and removing these SNPs reduces the risk of bias due to allelic ambiguity (Supplementary Table S6) (Hartwig et al., 2016).

(8) The MR analysis excluded less than three valid SNPs.

(9) Only SNPs that satisfy conditions (1)-(8) were eligible for inclusion in the MR analysis.

2.4 Statistical Analysis

R software was used for all analyses in this study (version 4.3.1) (Hemani et al., 2018). The R packages used are "TwoSampleMR" package (version 0.5.7), "MR-PRESSO" package (version 1.0), and "mr.raps" package (version 0.4.1).

2.4.1 MR Analysis

The MR method was employed in our study, with the primary approach being the inverse variance weighted (IVW) method, to explore causal relationships. The IVW method estimates the overall causal effect by integrating the Wald ratio effect values across SNPs, using the inverse of the variance as weights (Pierce & Burgess, 2013). This study also used the Mendelian randomized Egger regression (MR-Egger) method, the weighted median method, the simple model, the weighted model, and the Mendelian randomized robust adjusted profile score (MR-RAPS) method for statistical analysis. The slope coefficients of Egger regression are effective in estimating causal effects. The MR-Egger method can produce accurate estimates of causal effects, provided the InSIDE assumptions are met, even in cases where the genetic variants used as instruments may not be fully valid (Burgess & Thompson, 2017). The weighted median method assumes that consistent estimates can be achieved when 50% of SNPs are derived from valid IVs (Bowden et al., 2016). The MR-RAPS method provides robust results for heterogeneity and multiplicity analyses (Zhao et al., 2020). Any p-value below 0.05 using the MR method described in this study was considered significant.

2.4.2 Heterogeneity, Horizontal Pleiotropy, and Sensitivity Analysis

To ensure the accuracy of the MR findings, this study used the following methods to evaluate and address potential biases and violations of MR assumptions. Cochran's Q test was used to evaluate heterogeneity. When $p<0.05$ was identified as being heterogeneous, the multiplicative random effects (MRE) model of the IVW method was used. If there is no heterogeneity ($p>0.05$), the fixed effects (FE) model of the IVW method was used (Greco et al., 2015). The existence of horizontal pleiotropy in MR analyses was evaluated by utilizing the intercept test in the MR-Egger regression method, and horizontal pleiotropy was defined as $p<0.05$ (Bowden et al., 2015). The Mendelian Randomized Pleiotropy RESidual Sum and Outlier (MR-PRESSO) test was subsequently used to assess the horizontal pleiotropy and outliers of the SNPs (Verbanck et al., 2018). The test was performed when the number of genetic instruments was ≥4, and 3,000 permutations were set to identify outlier SNPs (outliers were defined as $p<0.05$) and perform a global pleiotropy test (horizontal pleiotropy was defined as $p<0.05$). If outliers were detected, the MR analysis was repeated after removing the outlier SNPs. Finally, a leave-one-out test was performed to sequentially exclude individual SNPs to assess their driving effect on the outcome.

2.4.3 Statistical Power Calculation

This study also employed the mRnd web tool (https://shiny.cnsgenomics.com/mRnd/) to calculate the statistical power of the MR analysis results. Using 80% as the threshold for statistical power, there was 80% confidence in rejecting the false null hypothesis, assuming that the power estimate for a single food factor was based on a Type I error of 0.05 (Brion et al. 2013).

3 Result

3.1 MR Results Presentation

The results of the MR analysis in this study were illustrated using various graphical representations, including forest plots, funnel plots, scatter plots, and leave-one-out analysis plots. This study was written, and the results were presented in strict accordance with the latest guidelines for MR studies in Supplementary Table S1 (Skrivankova et al., 2021).

3.2 Selection of IVs

After the LD test, the removal of confounding factors, the MR Steiger filtering test, and the removal of palindromes and incompatible SNPs, we selected eligible SNPs as IVs. Because the number of valid SNPs for average weekly fortified wine intake was less than 2, this GWAS was excluded from the MR analysis, and 22 kinds of dietary factors were finally included. Table 1 provides details of the 22 kinds of dietary factors and PCa data. The number of SNPs associated with the 22 different dietary factors was between 3 and 72. All IVs have F-statistics above 10, ranging from 29.740 to 269.707. This indicates that the IVs employed satisfy the criteria for a robust correlation with exposure and avoid bias caused by weak IVs. Supplementary Table S3 lists the SNPs used in the MR analysis of 22 dietary factors and PCa and the results of the MR Steiger filtering test. For exposures and outcome data, there was little overlap between the populations.

Table 1 Information of the 22 kinds of dietary factors and PCa

IEU Open GWAS Project ID	Trait	Ancestry	Sample size (N)	Year	Identified SNPs
Exposure					
ukb-b-5779	Alcohol intake frequency	European	462,346	2018	72
ukb-b-5239	Average weekly red wine intake	European	327,026	2018	10
ukb-b-5716	Average weekly champagne plus white wine intake	European	326,801	2018	3
ukb-b-1707	Average weekly spirits intake	European	326,565	2018	3
ukb-b-5174	Average weekly beer plus cider intake	European	327,634	2018	12
ukb-b-6324	Processed meat intake	European	461,981	2018	18
ukb-b-8006	Poultry intake	European	461,900	2018	4
ukb-b-2862	Beef intake	European	461,053	2018	9
ukb-b-17627	Non-oily fish intake	European	460,880	2018	8
ukb-b-2209	Oily fish intake	European	460,443	2018	47
ukb-b-5640	Pork intake	European	460,162	2018	9
ukb-b-14179	Lamb/mutton intake	European	460,006	2018	24
ukb-b-11348	Bread intake	European	452,236	2018	25
ukb-b-1489	Cheese intake	European	451,486	2018	50
ukb-b-8089	Cooked vegetable intake	European	448,651	2018	10
ukb-b-6066	Tea intake	European	447,485	2018	34
ukb-b-4078	Green tea intake	European	64,949	2018	21
ukb-b-3881	Fresh fruit intake	European	446,462	2018	37
ukb-b-15926	Cereal intake	European	441,640	2018	24
ukb-b-1996	Salad/raw vegetable intake	European	435,435	2018	14
ukb-b-5237	Coffee intake	European	428,860	2018	25
ukb-b-16576	Dried fruit intake	European	421,764	2018	28
Outcome					
finn-b-C3_PROST ATE_EXALLC	Prostate cancer	European	6,311 cases and 74,685 controls	2021	N/A

Abbreviations: SNPs, single nucleotide polymorphisms.

3.3 Causal Estimates of Genetic Susceptibility to Dietary Factors and PCa Risk

In the present study, a total of 3 dietary factors were identified as being causally associated with PCa (p<0.05), according to Supplementary Table S8, Figure 3, and the FE model in the IVW method. Average weekly beer plus cider intake [IVW_FE: odds ratio (OR) =3.305, 95% confidence interval (CI): 1.059-10.320, p=0.040] was associated with an increased risk of PCa. This finding was further validated by the weighted median method (OR=5.790, 95% CI: 1.128-29.729, p=0.035) and the MR-RAPS method (OR=4.137, 95% CI: 1.237-13.837, p=0.022). Oily fish intake (IVW_FE: OR=1.877, 95% CI: 1.147-3.070, p=0.012) was associated with increased PCa risk. This finding was further validated in the MR-RAPS method (OR=1.747, 95% CI: 1.039-2.937, p=0.035). Green tea intake (IVW_FE: OR=0.985, 95% CI: 0.974-0.997, p=0.014) was associated with a reduced risk of PCa. This finding was further validated in the MR-RAPS method (OR=0.984, 95% CI: 0.971-0.997, *p*=0.013).

In addition, alcohol intake frequency (IVW_FE: OR=1.098, 95% CI: 0.852-1.417, *p*=0.470), average weekly red wine intake (IVW_FE: OR=2.671, 95% CI: 0.844-8.448, *p*=0.095), average weekly champagne plus white wine intake (IVW_FE: OR=1.041, 95% CI: 0.129-8.420, *p*=0.970), average weekly spirits intake (IVW_MRE: OR=0.313, 95% CI: 0.006-17.573, *p*=0.572), processed meat intake (IVW_FE: OR=0.532, 95% CI: 0.245-1.158, *p*=0.112), poultry intake (IVW_FE: OR=1.484, 95% CI: 0.183-12.026, *p*=0.712), beef intake (IVW_FE: OR=1.895, 95% CI: 0.466-7.703, *p*=0.371), non-oily fish intake (IVW_FE: OR=2.815, 95% CI: 0.599-13.221, *p*=0.190), pork intake (IVW_FE: OR=1.339, 95% CI: 0.261-6.876, *p*=0.726), lamb/mutton intake (IVW_FE: OR=0.907, 95% CI: 0.338-2.435, *p*=0.846), bread intake (IVW_FE: OR=1.516, 95% CI: 0.774-2.970, *p*=0.225), cheese intake (IVW_FE: OR=0.899, 95% CI: 0.581-1.391, *p*=0.633), cooked vegetable intake (IVW_FE: OR=1.677, 95% CI: 0.405-6.940, *p*=0.475), tea intake (IVW_FE: OR=1.215, 95% CI: 0.723-2.042, *p*=0.461), fresh fruit intake (IVW_FE: OR=1.684, 95% CI: 0.697-4.067, *p*=0.247), cereal intake (IVW_FE: OR=1.794, 95% CI: 0.825-3.900, *p*=0.140), salad/raw vegetable intake (IVW_FE: OR=2.827, 95% CI: 0.636-12.573, *p*=0.172), coffee intake (IVW_FE: OR=0.519, 95% CI: 0.234-1.148, *p*=0.105), and dried fruit intake (IVW_FE: OR=1.411, 95% CI: 0661-3.010, *p*=0.374) were not causally associated with the development of PCa.

3.4 Results of Heterogeneity, Pleiotropy, and Sensitivity Analysis of Genetic Susceptibility to Dietary Factors and Risk for PCa

Heterogeneity, pleiotropy, and sensitivity analysis of average weekly beer plus cider intake, oily fish intake, and green tea intake in relation to the risk of PCa showed that Cochran's *Q* test did not show heterogeneity (*p*>0.05) (Supplementary Table S9). The intercept test for the MR-Egger regression and the MR-PRESSO global test did not find any evidence of horizontal pleiotropy (*p*>0.05) (Supplementary Table S9). The MR-RESSO outlier test and leave-one-out analysis did not find outliers, and the results were robust [Figures 4 (A-D) – 6 (A-D) and Supplementary Table S9]. At last, the statistical efficacy of the MR analysis results between positive results and PCa risk was assessed (Supplementary Table S10).

The results of heterogeneity, pleiotropy, and sensitivity analysis of alcohol intake frequency, average weekly red wine intake, average weekly champagne plus white wine intake, average weekly spirits intake, processed meat intake, poultry intake, beef intake, non-oily fish intake, pork intake, lamb/mutton intake, bread intake, cheese intake, cooked vegetable intake, tea intake, fresh fruit intake, cereal intake, salad/raw vegetable intake, coffee intake, and dried fruit intake with PCa risk showed that, except for average weekly spirits intake (p<0.05), the remaining studies had no heterogeneity (p>0.05) (Supplementary Table S9). Since the number of effective SNPs for average weekly champagne plus white wine intake and average weekly spirits intake was 3, the MR-PRESSO test could not be performed, and the MR-PRESSO global test of the remaining studies did not show horizontal pleiotropy (p>0.05). The MR-PRESSO outlier test of the above studies did not detect any abnormalities (Supplementary Table S9). The MR-Egger intercept test of the regressions of the above studies did not show horizontal pleiotropy (p>0.05) (Supplementary Table S9). The leave-one-out analysis of the above studies did not reveal outliers [Supplementary Figures 1 (A-D) – 19 (A-D)].

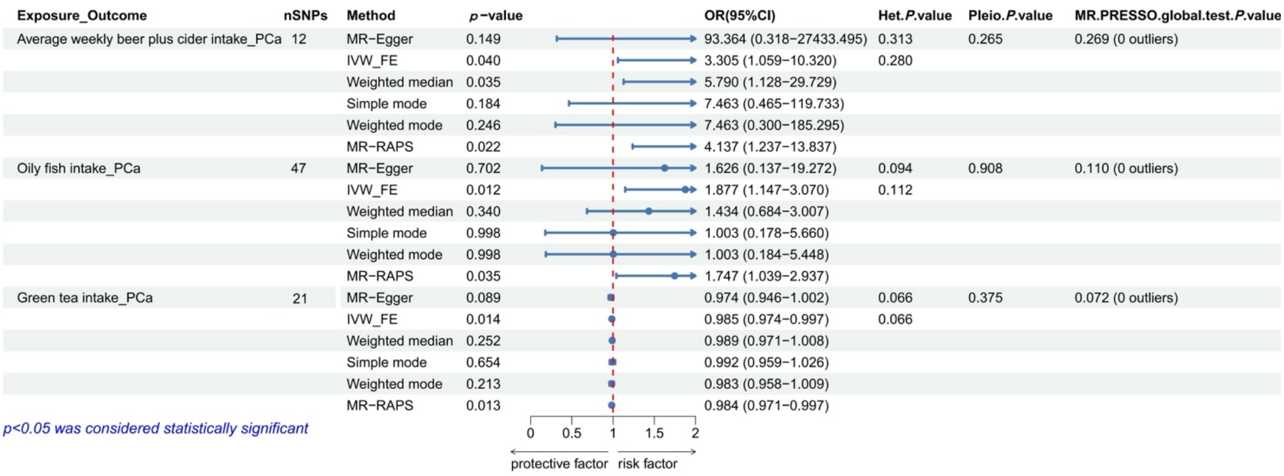


Figure 3 MR analysis results of the causal relationship between dietary factors and PCa

Abbreviations: CI, confidence interval; FE, fixed effects model; IVW, inverse variance weighted; MR-Egger, Mendelian randomization Egger regression; MR-PRESSO, Mendelian randomization Pleiotropy RESidual Sum and Outlier; MR-RAPS, Mendelian randomized robust adjusted profile score; OR, odd ratios; PCa, prostate cancer; SNPs, single nucleotide polymorphisms.

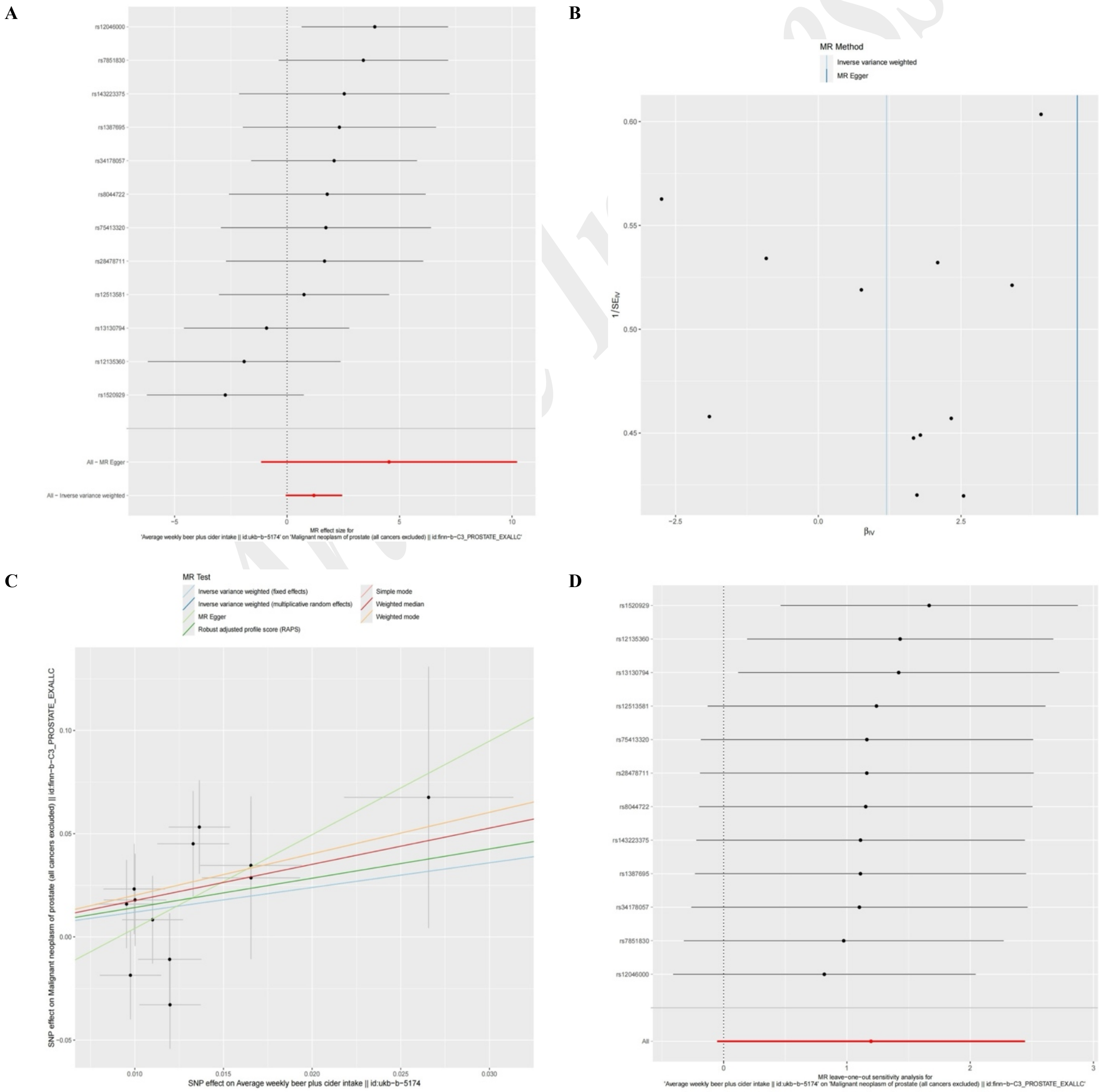


Figure 4 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between average weekly beer plus cider intake and PCa in MR analysis

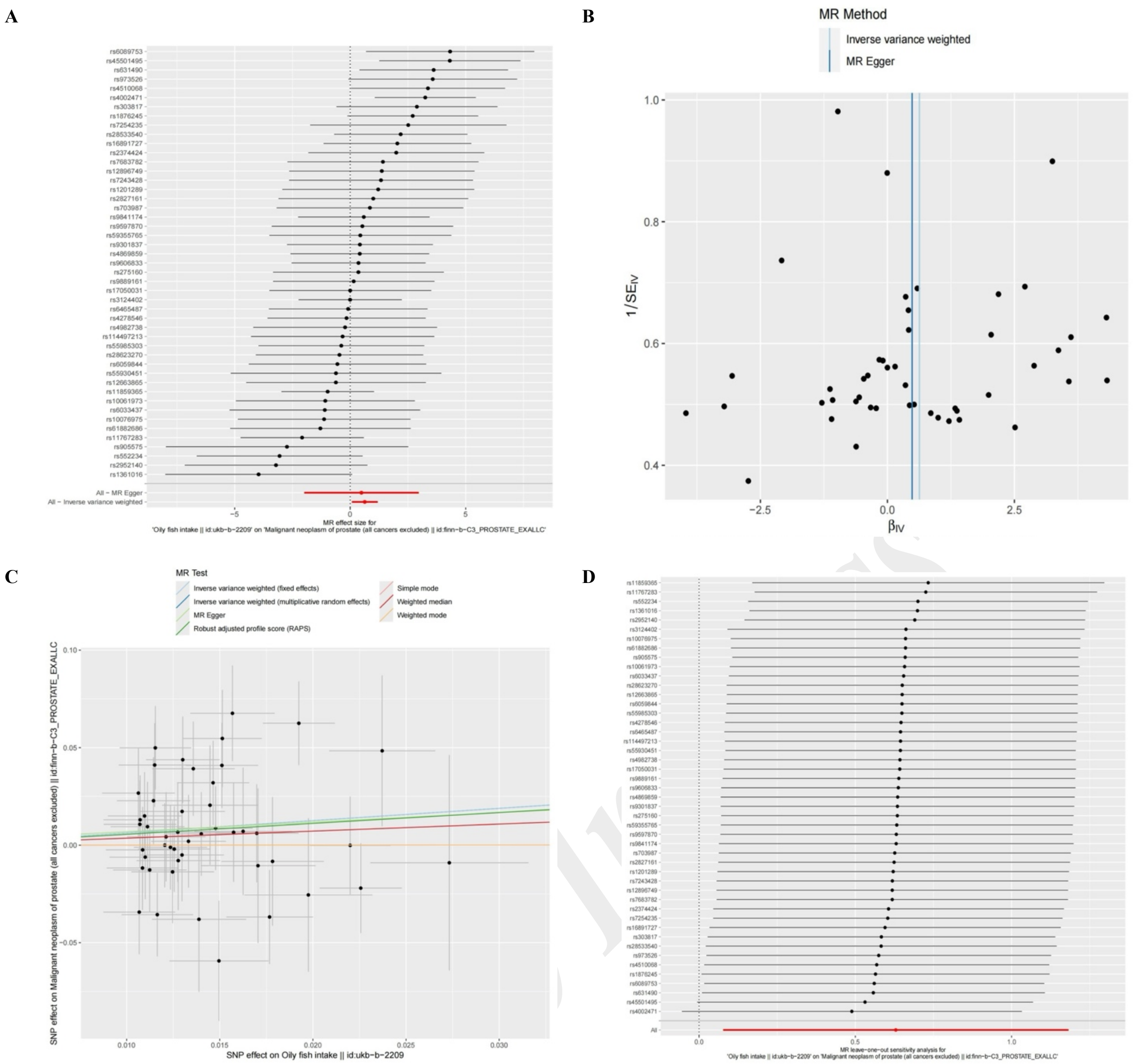
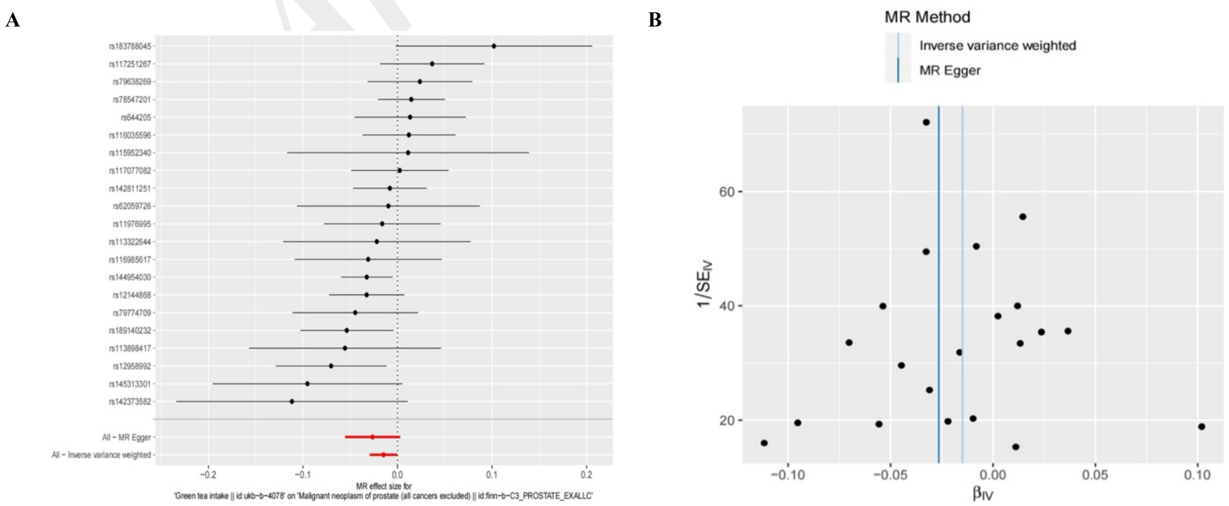


Figure 5 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between oil fish intake and PCa in MR analysis



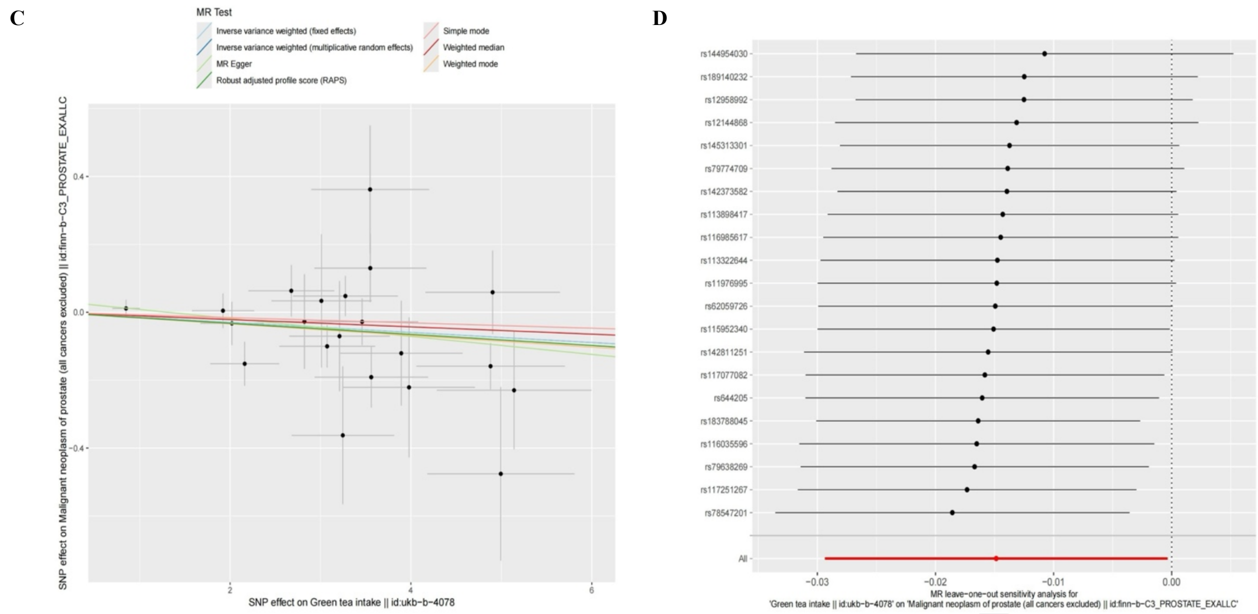


Figure 6 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between green tea intake and PCa in MR analysis

4 Discussion

In this study, the TSMR method was applied to analyze the correlation between 22 different dietary factors and the risk of PCa. The results indicated that average weekly beer plus cider intake, as well as oily fish intake, were connected to a higher likelihood of developing PCa. Conversely, green tea intake has been associated with a reduction in the risk of PCa.

4.1. Average Weekly Beer Plus Cider Intake and PCa

Alcohol intake may be linked to several cancers. In 2020, about 4.1% of all newly diagnosed cancers were attributed to alcohol intake (Rumgay et al., 2021). Some studies showed conflicting links between alcohol intake and PCa risk. A global population-based research revealed a link between alcohol intake and an increased incidence of PCa (Ziouziou et al., 2021). A systematic review and meta-analysis revealed a notable correlation between alcohol intake levels, beginning at low quantities (>1.3g, <24g/day) and encompassing moderate, high, and excessive levels of alcohol intake, and the risk of PCa (Zhao et al., 2016). A case-control study carried out in Algeria revealed a significant relationship between the prevalence of PCa and alcohol intake overall (Lassed et al., 2016). However, a dose-response meta-analysis study showed that overall alcohol intake was not associated with incident PCa (Hong et al., 2020). A meta-analysis of dose-risk relationships study found no indication of a positive correlation between the alcohol intake and PCa risk, starting with light drinking (≤1 cup/day) and including moderate and heavy drinking compared to no or occasional drinking (Rota et al., 2012). Additionally, research has indicated that various forms of alcohol intake have different effects on PCa. A multi-ethnic cohort study in California found no association between intake of wine, beer, white wine, spirits, or mixed alcoholic beverages and PCa (Chao et al., 2010). A case-control study conducted in Australia demonstrated a positive correlation between elevated high intake of beer and spirits and a heightened likelihood of developing PCa. Conversely, no significant dose-response relationship was observed for red or white wine intake in relation to PCa risk. (Papa et al., 2017). A Canadian case-control study showed that individuals with a high intake of beer (consumed over 63 years) had a higher risk of advanced PCa, but no correlation was found between wine and PCa (Demoury et al., 2016). The prevalence of PCa is affected by the intake of different categories of alcoholic beverages. Most existing studies have primarily focused on the correlation between the frequency of alcohol intake and the risk of developing PCa. However, there is a notable deficiency in research examining the relationship between specific types of alcoholic beverages, such as cider, and the incidence of PCa, indicating a need for further investigation in this area. It should also be noted that conflicting results in observational studies may be due to confounding factors. The findings of this research study substantiate the notion that the average weekly intake of beer and cider is associated with an elevated risk of PCa.

There are many biological potential mechanisms between alcohol intake and the occurrence of cancer, but they are not fully understood, especially in terms of PCa. Several possible mechanisms have been proposed for the intake of alcohol (such as ethanol) to cause PCa to develop. First, the main metabolite of ethanol is acetaldehyde, which is formed by alcohol dehydrogenase. Acetaldehyde is considered a carcinogen and can promote oxidative stress and directly or indirectly damage deoxyribonucleic acid (DNA) by producing adducts that contribute to the occurrence of PCa (Cederbaum, 2012; Klein et al., 2006). Second, ethanol stimulates PCa by inhibiting DNA methylation and interfering with retinoid metabolic interactions (Seitz & Stickel, 2007). Third, alcohol may promote the development of PCa by changing estrogen and androgen levels and hormone distribution (Seitz & Stickel, 2007). Fourth, alcohol can produce inflammation (such as prostatitis) and immunosuppression (Jung et al., 2022).

4.2 Oil Fish Intake and PCa

Fish contain numerous vital nutrients, including essential omega-3 polyunsaturated fatty acids (n-3PUFA). In particular, oily fish are a major dietary source of n-3 long-chain polyunsaturated fatty acids (LCPUFA), such as eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA). Because of its antioxidant, anti-inflammatory, and other effects, research generally supports the idea that this fish is beneficial to cardiovascular disease or cancer (Li et al., 2020; Van Hecke et al., 2019). The results of studies looking into the connection between overall fish intake and PCa were inconsistent. A systematic review and dose-response meta-analysis showed no evidence that fish intake or omega-3 intake had a significant impact on PCa incidence rate, but there was a protective factor associated with PCa mortality (Aucoin et al. 2017; Eshaghian et al., 2023). A prospective study found a correlation between the intake of fish and a heightened likelihood of developing PCa (Allen et al., 2004). Among oily fish, it is possible that some of them are rich in fat, and excessive intake may affect oxidative stress in the body and damage DNA, thus promoting PCa, but this mechanism still needs to be thoroughly investigated (Oczkowski et al., 2021). In addition, there is concern that multiple cooking methods for fish, including frying, grilling, or marinating, can increase dietary fat intake, produce mutagenic compounds including heterocyclic amines (HCAs) and polycyclic aromatic hydrocarbons (PAHs), or alter the androgenic milieu, which may be linked to a heightened susceptibility to PCa (Chua et al. 2013; Joshi et al. 2012). Most of the current research has concentrated on the study of the correlation between overall fish intake and PCa. In the future, there should be a need to explore more specifically the effects of different fish species and their cooking methods on PCa, such as by conducting large-scale, multi-center prospective cohort studies and in-depth studies on the potential pathogenesis of oily fish and PCa, and to provide more robust evidence. The findings of this research study substantiate the notion that oil fish intake is linked to a higher risk of PCa.

4.3 Green Tea Intake and PCa

Green tea is a beverage that is more popular in Asia than in Europe. Modern people pay attention to its ability to prevent or slow down the development of diseases, particularly in the realm of cancer prevention. The catechins in green tea are an important component of tea polyphenols, especially a component called epigallocatechin gallate. Research reveals that it possesses antioxidant, anti-inflammatory, anti-cancer, and other properties (Musial et al., 2020). Green tea catechins have many potential mechanisms in anti-cancer, such as inhibiting metalloproteinase activity and regulating cell signaling pathways, including cell proliferation and apoptosis (Bonuccelli et al., 2018; Liu et al., 2017). The findings of this study were consistent with previous research that showed a protective factor between green tea intake and PCa. A systematic review and meta-analysis study indicated that taking more than 7 cups per day of green tea correlated with a linear reduction in the risk of PCa (Guo et al., 2017). A prospective study shows that intake of green tea may lower the likelihood of developing advanced PCa (Kurahashi et al., 2008). A meta-analysis study showed that green tea was a protective factor against PCa, particularly in Asian populations (Zheng et al., 2011). However, previous studies have also shown no significant relationship between green tea and PCa (Lin et al., 2014; Montague et al., 2012). Overall, the way and dosage of green tea may also affect its effect. Green tea may have certain potential benefits in preventing PCa, but more experimental research is needed to clarify its role and the best way to use it. The findings of this research study substantiate the notion that green tea intake is associated with a reduced risk of PCa.

4.4 Other Dietary Factors and PCa

Studies that indicated the correlation between other dietary factors and PCa are outlined as follows: A systematic review and meta-analysis have indicated that higher intakes of total meat (including processed meat like bacon and ham) and red meat (primarily beef, lamb/mutton, and pork) could be linked to an elevated likelihood of PCa (Nouri-Majd et al., 2022). However, this research did not find a correlation between pork, beef, lamb/mutton, processed meat, and PCa. There may be confounding factors in previous studies. A meta-analysis study demonstrated that increasing daily coffee intake by two cups was linked to a decreased likelihood of PCa (Zhong et al. 2014). Nevertheless, this study has not discovered a link between coffee intake and PCa, consistent with the findings of an earlier MR study (Wang et al., 2021). A systematic review and meta-analysis showed that fruit and vegetable intake barely reduced the risk of PCa, consistent with this study (Yan et al., 2022). A meta-analysis study did not find a correlation between poultry intake and PCa risk, consistent with this study (He et al., 2016). There are few studies on the correlation between cheese and lamb/mutton intake and PCa.

4.5 Implications for Nursing Practice and Nursing Research

Although genes cannot be altered through environmental factors, their interaction with exposure factors (dietary factors) has important clinical significance. The causal association between diet and genes revealed in this study provides important insights for clinical nursing practice and future research.

In terms of primary disease prevention, the necessity of implementing personalized dietary guidance in cancer prevention is evident. Nurses use genetic risk assessments to develop targeted intervention plans for high-risk populations. For example, for high-risk populations carrying specific alleles, dietary guidance standards (such as weekly intake of beer plus cider, and oily fish) are recommended based on their genetic characteristics, and targeted dietary education based on genetic testing is conducted in regions with high consumption of oily fish.

In terms of community health promotion, by developing digital management platforms (such as customized APPs) to visualize individual genetic risks and combining local dietary cultural differences, personalized feedback can be provided to high-risk groups, ultimately achieving a paradigm shift from “universal intervention” to “gene-guided precision dietary intervention”.

Camak (2016) found that current nursing professionals still lack the ability to apply genetic knowledge to screen high-risk populations and meet the genetic health needs of patients and their families. This situation underscores the urgency of reforming nursing education, necessitating the systematic integration of genetics content into the educational course framework. Future nursing curriculum design should consider incorporating genetics to better align with the demands of the era of personalized care.

In terms of nursing research, future studies should further validate the biological mechanisms underlying the association between these dietary factors and prostate cancer incidence, explore the specific intake levels of dietary factors and their association with prostate cancer incidence in different populations across countries, and conduct genotype-guided dietary intervention randomized controlled trials. These efforts can facilitate the translation of genetic discoveries into clinical practice, thereby enabling nurses to implement precise dietary interventions for high-risk populations.

4.6 Advantages and Limitations

This research possesses several advantages. Firstly, this study used the MR study method, which was well-suited for establishing causal correlation between exposure factors and diseases and allowed us to better avoid confounding factors and bias caused by reverse causality. Secondly, this is a comparative study of the correlation between diverse dietary factors and PCa. Thirdly, Third, the genetic IVs selected for dietary factors and PCa in this study were derived from the GWAS summary data obtained from large sample sizes.

However, this study also has some limitations. First, the findings of this study require a degree of caution in their interpretation. Although the MR study method can address the issue of unobserved confounders, there may be differences in how food intake is measured (such as recall bias in questionnaires) and definitions, which may bias MR estimates. Second, because this study only used data from a European population, its conclusions might not apply to other populations. Third, this study did not stratify dietary intake by gender; summary statistics for PCa were only among men, and the use of sex-jointed instrumental variables may lead to biased causal effect estimates. Fourth, the issue of all food types was not fully considered. For example, the intake of oily fish in this study was not equal to the level of its active ingredients (such as omega-3).

5 Conclusion

This research demonstrates a correlation between higher intakes of average weekly beer plus cider, as well as oily fish intake, and an elevated risk of PCa. This study also indicates that a higher intake of green tea is correlated with a decreased likelihood of developing PCa. Other dietary factors are not associated with PCa. At present, the specific mechanism of action between dietary factors and PCa still needs to be clarified through in-depth research. When analyzing dietary factors, special attention should be paid to distinguishing male and female participants.

CRediT Authorship Contribution Statement

Yaming He: conceptualization, methodology, software, visualization, investigation, data curation, writing – original draft preparation. Jianwei Wu: methodology, formal analysis, writing – review and editing. Yinqi She: software, investigation, data curation. Yi Wen: methodology. Ning Liu: conceptualization, methodology, writing – review and editing.

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Conflicts of Interest

The authors affirm that there were no identifiable financial interest or personal relationships that have impacted the research presented in this article.

Data Availability

This study analyzes publicly available datasets. The data can be found in: IEU Open GWAS Project (https://gwas.mrcieu.ac.uk/), UR Biobank (https://www.ukbiobank.ac.uk/), FinnGen consortium (https://r5.finngen.fi/).

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Supplementary Table 1 STROBE-MR checklist

Item No.	Section	Checklist item	Manuscript section and paragraph
Title and abstract			
1	Title and abstract	Indicate Mendelian randomization (MR) as the study's design in the title and/or the abstract if that is a main purpose of the study	Title; Abstract
Introduction			
2	Background	Explain the scientific background and rationale for the reported study. What is the exposure? Is a potential causal relationship between exposure and outcome plausible? Justify why MR is a helpful method to address the study question.	1 Introduction, paragraphs 1–3
3	Objectives	State specific objectives clearly, including prespecified causal hypotheses (if any). State that MR is a method that, under specific assumptions, intends to estimate causal effects.	1 Introduction, paragraph 3
Methods			
4	Study design and data sources	Present key elements of the study design early in the article. Consider including a table listing sources of data for all phases of the study. For each data source contributing to the analysis, describe the following:	
a		Setting: Describe the study design and the underlying population, if possible. Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection, when available.	2.1 Study Design; 2.2 Data Sources; Figure1; Figure 2
b		Participants: Report the eligibility criteria and the sources and methods of selection of participants. Report the sample size and whether any power or sample size calculations were carried out prior to the main analysis.	(i) Report the eligibility criteria and the sources and methods of selection of participants: 1) 2.2 Data Sources, paragraphs 2-3; 2) Table 1; 3) Supplementary Table 2; (ii) Report the sample size and whether any power or sample size calculations were carried out prior to the main analysis: 1) 2.4.3 Statistical Power Calculation; 2) Supplementary Table 10
c		Describe measurement, quality control, and selection of genetic variants.	2.3 Selection of IVs
d		For each exposure, outcome, and other relevant variables, describe methods of assessment and diagnostic criteria for diseases.	2.2 Data Sources, paragraph 3; Supplementary Table 2
e		Provide details of ethics committee approval and participant informed consent, if relevant.	2.2 Data Sources, paragraph 3
5	Assumptions	Explicitly state the 3 core instrumental variable (IV) assumptions for the main analysis (relevance, independence, and exclusion restriction), as well assumptions for any additional or sensitivity analysis.	2.1 Study Design; Figure 2
6	Statistical methods: main analysis	Describe statistical methods and statistics used.	
a		Describe how quantitative variables were handled in the analyses (i.e., scale, units, model).	2.4.1 MR Analysis
b		Describe how genetic variants were handled in the analyses and, if applicable, how their weights were selected.	2.4.1 MR Analysis
c		Describe the MR estimator (e.g., 2-stage least squares, Wald ratio) and related statistics. Detail the included covariates and, in case of 2-sample MR, whether the same covariate set was used for adjustment in the 2 samples.	2.4.1 MR Analysis
d		Explain how missing data were addressed.	2.3. Selection of IVs
e		If applicable, indicate how multiple testing was addressed.	2.4.1 MR Analysis
7	Assessment of assumptions	Describe any methods or prior knowledge used to assess the assumptions or justify their validity.	2.4.2 Heterogeneity, Horizontal Pleiotropy, and Sensitivity Analysis

8	Sensitivity analyses and additional analyses	Describe any sensitivity analyses or additional analyses performed (e.g., comparison of effect estimates from different approaches, independent replication, bias analytic techniques, validation or instruments, simulations).	2.4.2 Heterogeneity, Horizontal Pleiotropy, and Sensitivity Analysis
9	Software and preregistrations		
	a	Name statistical software and package(s), including version and settings used.	2.4 Statistical Analysis, paragraph 1
	b	State whether the study protocol and details were preregistered (as well as when and where).	N/A
Results			
10	Descriptive data		
	a	Report the numbers of individuals at each stage of included studies and reasons for exclusion. Consider use of a flow diagram.	3.2 Selection of IVs; Table 1; Supplementary Table 3–7
	b	Report summary statistics for phenotypic exposure(s), outcome(s), and other relevant variables (e.g., means, SDs, proportions).	3.2 Selection of IVs; Supplementary Table 3
	c	If the data sources include meta-analyses of previous studies, provide the assessments of heterogeneity across these studies.	N/A
	d	For 2-sample MR: (i) Provide justification of the similarity of the genetic variant-exposure associations between the exposure and outcome samples. (ii) Provide information on the number of individuals who overlap between the exposure and outcome studies.	(i) Provide justification of the similarity of the genetic variant-exposure associations between the exposure and outcome samples: N/A (ii) Provide information on the number of individuals who overlap between the exposure and outcome studies: 3.2 Selection of IVs
11	Main results		
	a	Report the associations between genetic variant and exposure and between genetic variant and outcome, preferably on an interpretable scale.	3.3 Causal Estimate of Genetic Susceptibility to Dietary Factors and PCa risk; Supplementary Table 8
	b	Report MR estimates of the relationship between exposure and outcome and the measures of uncertainty from the MR analysis, on an interpretable scale, such as odds ratios or relative risk per SD difference.	3.3 Causal Estimate of Genetic Susceptibility to Dietary Factors and PCa risk; Supplementary Table 8
	c	If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period.	N/A
	d	Consider plots to visualize results (e.g., forest plot, scatterplot of associations between genetic variants and outcome vs between genetic variants and exposure).	Figures 3-6; Supplementary Figures 1 (A-D) – 19 (A-D)
12	Assessment of assumptions		
	a	Report the assessment of the validity of the assumptions.	3.4 Results of Heterogeneity, Pleiotropy, and Sensitivity Analysis of Genetic Susceptibility to Dietary Factors and Risk for PCa; Supplementary Table 9
	b	Report any additional statistics (e.g., assessments of heterogeneity across genetic variants, such as I2, Q statistics, or E-value).	3.4 Results of Heterogeneity, Pleiotropy, and Sensitivity Analysis of Genetic Susceptibility to Dietary Factors and Risk for PCa; Supplementary Table 9
13	Sensitivity analyses and additional analyses		
	a	Report any sensitivity analyses to assess the robustness of the main results to violations of the assumptions.	3.4 Results of Heterogeneity, Pleiotropy, and Sensitivity Analysis of Genetic Susceptibility to Dietary Factors and Risk for PCa; Supplementary Table 9
	b	Report results from other sensitivity analyses or additional analyses.	3.4 Results of Heterogeneity, Pleiotropy, and Sensitivity Analysis of Genetic Susceptibility to Dietary Factors and

			Risk for PCa; Supplementary Table 9; Supplementary Table 10
	c	Report any assessment of the direction of the causal relationship (e.g., bidirectional MR).	N/A
	d	When relevant, report and compare with estimates from non-MR analyses.	N/A
	e	Consider additional plots to visualize results (e.g., leave-one-out analyses).	Figures 4 (A-D) – 6 (A-D); Supplementary Figures 1 (A-D) – 19 (A-D)
Discussion			
14	Key results	Summarize key results with reference to study objectives.	4 Discussion, paragraph 1
15	Limitations	Discuss limitations of the study, taking into account the validity of the IV assumptions, other sources of potential bias, and imprecision. Discuss both direction and magnitude of any potential bias and any efforts to address them.	4.6 Advantages and Limitations
16	Interpretation		
	a	Meaning: Give a cautious overall interpretation of results in the context of their limitations and in comparison with other studies.	4.1 Average Weekly Beer Plus Cider Intake and PCa; 4.2 Oil Fish Intake and PCa; 4.3 Green Tea Intake and PCa; 4.4 Other Dietary Factors and PCa
	b	Mechanism: Discuss underlying biological mechanisms that could drive a potential causal relationship between the investigated exposure and the outcome, and whether the gene-environment equivalence assumption is reasonable. Use causal language carefully, clarifying that IV estimates may provide causal effects only under certain assumptions.	4.1 Average Weekly Beer Plus Cider Intake and PCa; 4.2 Oil Fish Intake and PCa; 4.3 Green Tea Intake and PCa
	c	Clinical relevance: Discuss whether the results have clinical or public policy relevance, and to what extent they inform effect sizes of possible interventions.	4.5 Implications for Nursing Practice and Nursing Research
17	Generalizability	Discuss the generalizability of the study results (a) to other populations, (b) across other exposure periods/timings, and (c) across other levels of exposure.	4.6 Advantages and Limitations
Other information			
18	Funding	Describe sources of funding and the role of funders in the present study and, if applicable, sources of funding for the databases and original study or studies on which the present study is based.	N/A
19	Data and data sharing	Provide the data used to perform all analyses or report where and how the data can be accessed, and reference these sources in the article. Provide the statistical code needed to reproduce the results in the article or report whether the code is publicly accessible and, if so, where.	Data Availability
20	Conflicts of interest	All authors should declare all potential conflicts of interest.	Conflict of Interest

Reference: Skrivankova, V. W., Richmond, R. C., Woolf, B. A. R., Yarmolinsky, J., Davies, N. M., Swanson, S. A., VanderWeele, T. J., Higgins, J. P. T., Timpson, N. J., Dimou, N., Langenberg, C., Golub, R. M., Loder, E. W., Gallo, V., Tybjaerg-Hansen, A., Davey Smith, G., Egger, M., & Richards, J. B. (2021). Strengthening the reporting of observational studies in epidemiology using Mendelian randomization: the STROBE-MR statement. *Jama, 16,* 1614-1621. https://doi.org/10.1001/jama.2021.18236

Supplementary Table 2 Information on the questionnaire investigating the intake of 23 foods and the diagnostic criteria for PCa

IEU Open GWAS Project ID	Trait	Definition	Data-Field ID	Source
ukb-b-5779	Alcohol intake frequency	ACE touchscreen question "About how often do you drink alcohol?" If the participant activated the Help button they were shown the message: If this varies a lot, please provide an average considering your intake over the last year. Options include: (1) Daily or almost daily, (2) Three or four times a week, (3) Once or twice a week, (4) One to three times a month, (5) Special occasions only, (6) Never, (7) Prefer not to answer.	1558	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1558
ukb-b-5174	Average weekly fortified wine intake	ACE touchscreen question "In an average WEEK, how many glasses of fortified wine would you drink? (There are 12 glasses in an average bottle) (Fortified wines include drinks such as sherry, port, vermouth)" The following checks were performed: If answer < 0 then rejected; If answer > 250 then rejected; If answer > 100 then participant asked to confirm; If the participant activated the Help button they were shown the message: Fortified wines include: Sherry, Port, Vermouth, Muscat, Madeira, Malaga, Tokay, Frontignan, Frontignac. Field 1608 was collected from participants who indicated they drink alcohol more often than once or twice a week, as defined by their answers to Field 1558. Coding 100291 defines 2 special values: -1 represents "Do not know", -3 represents "Prefer not to answer"	1608	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1608
ukb-b-5239	Average weekly red wine intake	ACE touchscreen question "In an average WEEK, how many glasses of RED wine would you drink? (There are six glasses in an average bottle) The following checks were performed: If answer < 0 then rejected; If answer > 250 then rejected; If answer > 100 then participant asked to confirm; If the participant activated the Help button they were shown the message: Please include sparkling red wine here. Field 1568 was collected from participants who indicated they drink alcohol more often than once or twice a week, as defined by their answers to Field 1558. Coding 100291 defines 2 special values: -1 represents "Do not know", -3 represents "Prefer not to answer"	1568	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1568
ukb-b-5716	Average weekly champagne plus white wine intake	ACE touchscreen question "In an average WEEK, how many glasses of WHITE wine or champagne would you drink? (There are six glasses in an average bottle)" The following checks were performed: If answer < 0 then rejected; If answer > 250 then rejected; If answer > 100 then participant asked to confirm; If the participant activated the Help button they were shown the message: Please include sparkling white wine here. Field 1568 was collected from participants who indicated they drink alcohol more often than once or twice a week, as defined by their answers to Field 1558. Coding 100291 defines 2 special values: -1 represents "Do not know", -3 represents "Prefer not to answer"	1578	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1578

ukb-b-1707	Average weekly spirits intake	ACE touchscreen question "In an average WEEK, how many measures of spirits or liqueurs would you drink? (there are 25 standard measures in a normal sized bottle; spirits include drinks such as whisky, gin, rum, vodka, brandy)" The following checks were performed: If answer < 0 then rejected; If answer > 250 then rejected; If answer > 100 then participant asked to confirm; If the participant activated the Help button they were shown the message: For mixed drinks that contain spirits or liqueurs, count one bottle as one measure. There is a question later on alcopops Field 1598 was collected from participants who indicated they drink alcohol more often than once or twice a week, as defined by their answers to Field 1558. Coding 100291 defines 2 special values: -1 represents "Do not know", -3 represents "Prefer not to answer"	1598	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1598
ukb-b-5174	Average weekly beer plus cider intake	ACE touchscreen question "In an average WEEK, how many pints of beer or cider would you drink? (Include bitter, lager, stout, ale, Guinness) The following checks were performed: If answer < 0 then rejected; If answer > 250 then rejected; If answer > 100 then participant asked to confirm; Field 1598 was collected from participants who indicated they drink alcohol more often than once or twice a week, as defined by their answers to Field 1558. Coding 100291 defines 2 special values: -1 represents "Do not know", -3 represents "Prefer not to answer"	1588	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1588
ukb-b-6324	Processed meat intake	ACE touchscreen question "How often do you eat processed meats (such as bacon, ham, sausages, meat pies, kebabs, burgers, chicken nuggets)?" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.	1349	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1349
ukb-b-8006	Poultry intake	ACE touchscreen question "How often do you eat chicken, turkey or other poultry? (Do not count processed meats)" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Poultry include fowl (e.g. chicken, turkey, quail), waterfowl (e.g. duck, goose) and game (e.g. pheasant). Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.	1359	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1359
ukb-b-2862	Beef intake	ACE touchscreen question "How often do you eat beef? (Do not count processed meats)" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.	1369	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1369

ukb-b-17627	Non-oily fish intake	ACE touchscreen question "How often do you eat other types of fish? (e.g. cod, tinned tuna, haddock)" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.	1339	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1339
ukb-b-2209	Oily fish intake	ACE touchscreen question "How often do you eat oily fish? (e.g. sardines, salmon, mackerel, herring)" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Oily fish include: Salmon Anchovies, Trout Swordfish, Mackerel Bloater, Herring Cacha, Sardines Carp, Pilchards Hilsa, Kipper Jack fish, Eel Katla, Whitebait Orange roughy, Tuna (fresh only) Pangas, Sprats. Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.	1329	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1329
ukb-b-5640	Pork intake	ACE touchscreen question "How often do you eat pork? (Do not count processed meats such as bacon or ham)" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.	1389	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1389
ukb-b-14179	Lamb/mutton intake	ACE touchscreen question "How often do you eat lamb/mutton? (Do not count processed meats)" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year.If you are unsure, please provide an estimate or select Do not know. Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.	1379	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1379
ukb-b-11348	Bread intake	ACE touchscreen question "How many slices of bread do you eat each WEEK?" The following checks were performed: If answer < 0 then rejected; If answer > 250 then rejected; If answer > 50 then participant asked to confirm; If the participant activated the Help button they were shown the message: For other types of bread: - one bread roll = 2 slices - one pitta bread = 2 slices Coding 100373 defines 3 special values: -10 represents "Less than one", -1 represents "Do not know", -3 represents "Prefer not to answer"	1438	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1438
ukb-b-1489	Cheese intake	ACE touchscreen question "How often do you eat cheese? (Include cheese in pizzas, quiches, cheese sauce etc)" If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know.	1408	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1408

		Field 1408 was collected from all participants except those who indicated that they never eat dairy products, as defined by their answers to Field 6144. Options include: (1) never, (2) once a week, (3) less than once a week, (4) 2-4 times a week, (5) 5-6 time a week, (6) once or more daily, (7) do not know, (8) prefer not to answer.		
ukb-b-8089	Cooked vegetable intake	ACE touchscreen question "On average how many heaped tablespoons of COOKED vegetables would you eat per DAY? (Do not include potatoes; put '0' if you do not eat any)" The following checks were performed: If answer > 50 then rejected; If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. If you have less than one tablespoon a day select Less than one. Coding 100373 defines 3 special values: -10 represents "Less than one"; -1 represents "Do not know"; -3 represents "Prefer not to answer"	1289	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1289
ukb-b-6066	Tea intake	ACE touchscreen question "How many cups of tea do you drink each DAY? (Include black and green tea)" The following checks were performed: If answer < 0 then rejected; If answer > 99 then rejected; If answer > 20 then participant asked to confirm; If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Coding 100373 defines 3 special values: -10 represents "Less than one"; -1 represents "Do not know"; -3 represents "Prefer not to answer"	1488	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1488
ukb-b-4078	Green tea intake	24-hour dietary recall questionnaire, question asked: "How many cups/mugs of green tea did you drink yesterday?" The original questionnaire divided the number of cups of tea into 0, 1, 2, 3, 4, 5, and ≥ 6 cups and one cup means 250 mL	100420	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=100420
ukb-b-3881	Fresh fruit intake	ACE touchscreen question "About how many pieces of FRESH fruit would you eat per DAY? (Count one apple, one banana, 10 grapes etc as one piece; put '0' if you do not eat any)" The following checks were performed: If answer > 50 then rejected; If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Coding 100373 defines 3 special values: -10 represents "Less than one"; -1 represents "Do not know"; -3 represents "Prefer not to answer"	1309	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1309
ukb-b-15926	Cereal intake	ACE touchscreen question "How many bowls of cereal do you eat a WEEK?" The following checks were performed: If answer < 0 then rejected; If answer > 99 then rejected; If answer > 14 then participant asked to confirm; If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know.	1458	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1458

		Coding 100373 defines 3 special values: -10 represents "Less than one"; -1 represents "Do not know"; -3 represents "Prefer not to answer"		
ukb-b-1996	Salad/raw vegetable intake	ACE touchscreen question "On average how many heaped tablespoons of SALAD or RAW vegetables would you eat per DAY? (Include lettuce, tomato in sandwiches; put '0' if you do not eat any)" The following checks were performed: If answer > 50 then rejected; If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. If you have less than one tablespoon a day select Less than one. Coding 100373 defines 3 special values: -10 represents "Less than one"; -1 represents "Do not know"; -3 represents "Prefer not to answer"	1299	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1299
ukb-b-5237	Coffee intake	ACE touchscreen question "How many cups of coffee do you drink each DAY? (Include decaffeinated coffee)" The following checks were performed: If answer < 0 then rejected; If answer > 99 then rejected; If answer > 10 then participant asked to confirm; If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Coding 100373 defines 3 special values: -10 represents "Less than one"; -1 represents "Do not know"; -3 represents "Prefer not to answer"	1498	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1498
ukb-b-16576	Dried fruit intake	ACE touchscreen question "About how many pieces of DRIED fruit would you eat per DAY? (Count one prune, one dried apricot, 10 raisins as one piece; put '0' if you do not eat any)" The following checks were performed: If answer > 100 then rejected; If the participant activated the Help button they were shown the message: Please provide an average considering your intake over the last year. If you are unsure, please provide an estimate or select Do not know. Coding 100373 defines 3 special values: -10 represents "Less than one"; -1 represents "Do not know"; -3 represents "Prefer not to answer"	1319	https://biobank.ctsu.ox.ac.uk/crystal/field.cgi?id=1319
finn-b-C3_PROSTATE_EXALLC	Prostate cancer	Participants with prostate cancer were diagnosed according to the ICD: Eighth Revision (ICD-8) and Ninth Revision (ICD-9) code 185, and Tenth Revision (ICD-10) code C61.	N/A	https://r5.finngen.fi/

Abbreviations: ICD, International Classification of Diseases; GWAS, Genome-Wide Association Studies; UKB, UK Biobank.

Supplementary Table 3 Information on the SNPs used in the MR analysis of 22 dietary factors and PCa and the results of the MR Steiger filtering test

	Exposure (22 dietary factors)							Outcome (Prostate cancer)										MR Steiger filtering test					
Exposure	**SNPs**	**EA**	**OA**	**Beta**	**EAF**	***p*-value**	**SE**	**EA**	**OA**	**Beta**	**EAF**	***p*-value**	**SE**	**CHR**	**POS**	**R^2**	***F*-statistic**	**rsq. exposure**	**effective_ n.exposure**	**rsq. outcome**	**effective_ n.outcome**	**steiger_ direction**	**steiger_ pval**
Alcohol intake frequency	rs2244598	C	T	-0.0184	0.6051	3.80E-09	0.0031	C	T	-0.0052	0.6062	8.14E-01	0.0221	1	216681000	7.51E-05	34.717	7.51E-05	462346	6.84E-07	80996	TRUE	3.96E-02
	rs28787109	A	G	0.0178	0.4042	7.70E-09	0.0031	A	G	0.0307	0.2430	2.14E-01	0.0247	1	51218695	7.21E-05	33.340	7.21E-05	462346	1.91E-05	80996	TRUE	2.79E-01
	rs4417025	A	G	-0.0188	0.3612	2.70E-09	0.0032	A	G	-0.0160	0.2371	5.24E-01	0.0251	1	35363679	7.66E-05	35.422	7.66E-05	462346	5.02E-06	80996	TRUE	8.73E-02
	rs4503294	T	C	0.0181	0.5653	3.40E-09	0.0031	T	C	0.0238	0.5524	2.69E-01	0.0215	1	940096	7.55E-05	34.932	7.55E-05	462346	1.51E-05	80996	TRUE	2.07E-01
	rs7514579	C	A	0.0197	0.2325	4.60E-08	0.0036	C	A	0.0430	0.2102	9.69E-02	0.0259	1	94051350	6.46E-05	29.881	6.46E-05	462346	3.40E-05	80996	TRUE	5.63E-01
	rs780569	A	T	0.0198	0.7088	4.00E-09	0.0034	A	T	-0.0093	0.7651	7.11E-01	0.025	1	4569436	7.49E-05	34.644	7.49E-05	462346	1.71E-06	80996	TRUE	5.37E-02
	rs10188314	T	C	-0.0198	0.4709	7.20E-11	0.0030	T	C	-0.0059	0.5227	7.80E-01	0.0213	2	215402926	9.19E-05	42.475	9.19E-05	462346	9.47E-07	80996	TRUE	2.38E-02
	rs13390019	C	T	0.0296	0.1340	4.30E-11	0.0045	C	T	-0.0023	0.0627	9.57E-01	0.0436	2	97797680	9.40E-05	43.459	9.40E-05	462346	3.44E-08	80996	TRUE	1.25E-02
	rs17662759	C	T	0.0301	0.0891	3.40E-08	0.0055	C	T	-0.0013	0.1071	9.69E-01	0.0345	2	193989223	6.59E-05	30.458	6.59E-05	462346	1.75E-08	80996	TRUE	3.61E-02
	rs1991083	T	C	-0.0224	0.6799	6.30E-12	0.0033	T	C	-0.0192	0.7476	4.30E-01	0.0244	2	23887437	1.02E-04	47.235	1.02E-04	462346	7.64E-06	80996	TRUE	5.39E-02
	rs2717063	A	C	-0.0204	0.5857	4.00E-11	0.0031	A	C	0.0164	0.6030	4.52E-01	0.0218	2	58110969	9.43E-05	43.612	9.43E-05	462346	6.99E-06	80996	TRUE	6.35E-02
	rs4241258	T	C	0.0251	0.1376	1.30E-08	0.0044	T	C	-0.0098	0.1020	7.82E-01	0.0354	2	74226102	7.01E-05	32.400	7.01E-05	462346	9.46E-07	80996	TRUE	5.21E-02
	rs6727281	T	C	-0.0243	0.1840	5.50E-10	0.0039	T	C	0.0086	0.2622	7.24E-01	0.0243	2	65558588	8.33E-05	38.504	8.33E-05	462346	1.55E-06	80996	TRUE	3.85E-02
	rs72769229	T	A	-0.0231	0.1549	3.40E-08	0.0042	T	A	-0.0242	0.1180	4.62E-01	0.0329	2	2220795	6.59E-05	30.465	6.59E-05	462346	6.68E-06	80996	TRUE	1.46E-01
	rs780094	C	T	-0.0510	0.6152	1.30E-60	0.0031	C	T	-0.0287	0.6416	1.96E-01	0.0222	2	27741237	5.83E-04	269.707	5.83E-04	462346	2.06E-05	80996	TRUE	2.64E-07
	rs1515591	G	T	0.0182	0.3832	4.90E-09	0.0031	G	T	0.0361	0.4444	9.19E-02	0.0214	3	174213976	7.40E-05	34.221	7.40E-05	462346	3.51E-05	80996	TRUE	4.82E-01
	rs262240	T	C	-0.0172	0.4686	1.40E-08	0.0030	T	C	-0.0279	0.3847	1.99E-01	0.0217	3	68408109	6.95E-05	32.147	6.95E-05	462346	2.04E-05	80996	TRUE	3.16E-01
	rs76082653	T	C	0.0464	0.0543	3.80E-12	0.0067	T	C	-0.0026	0.0314	9.66E-01	0.0607	3	49029468	1.04E-04	48.207	1.04E-04	462346	2.27E-08	80996	TRUE	8.26E-03
	rs7610856	A	C	-0.0239	0.4291	7.70E-15	0.0031	A	C	0.0386	0.3939	7.73E-02	0.0218	3	71579022	1.31E-04	60.415	1.31E-04	462346	3.87E-05	80996	TRUE	1.71E-01
	rs9829192	T	G	0.0169	0.4351	2.80E-08	0.0031	T	G	0.0378	0.4505	7.82E-02	0.0215	3	38569463	6.66E-05	30.814	6.66E-05	462346	3.82E-05	80996	TRUE	6.02E-01
	rs13102973	C	T	-0.0194	0.6188	4.90E-10	0.0031	C	T	0.0212	0.5648	3.21E-01	0.0214	4	135900688	8.37E-05	38.722	8.37E-05	462346	1.21E-05	80996	TRUE	1.37E-01
	rs2159935	A	G	-0.0186	0.4904	8.30E-10	0.0030	A	G	0.0155	0.4791	4.67E-01	0.0214	4	55521017	8.15E-05	37.682	8.15E-05	462346	6.48E-06	80996	TRUE	8.88E-02
	rs28622224	T	C	-0.0186	0.2804	3.20E-08	0.0034	T	C	-0.0005	0.2712	9.84E-01	0.024	4	55088093	6.61E-05	30.559	6.61E-05	462346	5.36E-09	80996	TRUE	3.44E-02
	rs62305780	G	C	-0.0485	0.1023	9.90E-22	0.0051	G	C	0.0328	0.1390	2.92E-01	0.0311	4	100290815	1.98E-04	91.741	1.98E-04	462346	1.37E-05	80996	TRUE	6.43E-03
	rs62339673	A	C	0.0183	0.6267	6.60E-09	0.0032	A	C	-0.0302	0.6516	1.76E-01	0.0223	4	184828533	7.28E-05	33.643	7.28E-05	462346	2.26E-05	80996	TRUE	3.22E-01
	rs11750777	A	G	-0.0205	0.2095	3.80E-08	0.0037	A	G	0.0317	0.1516	2.80E-01	0.0293	5	166830787	6.54E-05	30.248	6.54E-05	462346	1.45E-05	80996	TRUE	2.60E-01
	rs13178443	T	C	-0.0187	0.2763	3.80E-08	0.0034	T	C	-0.0016	0.3056	9.44E-01	0.0232	5	145615275	6.55E-05	30.274	6.55E-05	462346	5.87E-08	80996	TRUE	3.93E-02
	rs461599	C	A	-0.0192	0.4623	2.70E-10	0.0030	C	A	0.0415	0.4719	5.27E-02	0.0214	5	144136931	8.62E-05	39.849	8.62E-05	462346	4.64E-05	80996	TRUE	5.17E-01
	rs4916723	C	A	0.0239	0.4206	1.10E-14	0.0031	C	A	0.0095	0.4675	6.57E-01	0.0213	5	87854395	1.29E-04	59.696	1.29E-04	462346	2.46E-06	80996	TRUE	1.01E-02
	rs56194430	T	C	0.0225	0.1693	3.10E-08	0.0041	T	C	0.0544	0.1246	9.34E-02	0.0325	5	67824690	6.63E-05	30.649	6.63E-05	462346	3.46E-05	80996	TRUE	5.53E-01
	rs12153855	C	T	0.0294	0.1050	2.40E-09	0.0049	C	T	-0.1034	0.0593	2.26E-02	0.0453	6	32074804	7.70E-05	35.598	7.70E-05	462346	6.43E-05	80996	TRUE	8.43E-01
	rs9349379	G	A	-0.0193	0.4055	3.50E-10	0.0031	G	A	0.0074	0.4505	7.29E-01	0.0212	6	12903957	8.52E-05	39.396	8.52E-05	462346	1.50E-06	80996	TRUE	3.56E-02
	rs9403297	A	G	0.0188	0.3730	1.80E-09	0.0031	A	G	-0.0046	0.3070	8.41E-01	0.023	6	141705482	7.82E-05	36.158	7.82E-05	462346	4.94E-07	80996	TRUE	3.26E-02
	rs2622167	A	G	-0.0191	0.4287	4.60E-10	0.0031	A	G	-0.0067	0.3244	7.69E-01	0.0228	7	153486704	8.40E-05	38.835	8.40E-05	462346	1.07E-06	80996	TRUE	3.28E-02
	rs4726481	T	G	0.0218	0.4006	2.30E-12	0.0031	T	G	0.0003	0.3460	9.89E-01	0.0224	7	141668403	1.06E-04	49.218	1.06E-04	462346	2.21E-09	80996	TRUE	7.01E-03

	rs62466318	T	C	-0.0255	0.2028	1.40E-11	0.0038	T	C	0.0050	0.1926	8.52E-01	0.0268	7	73042085	9.87E-05	45.620	9.87E-05	462346	4.30E-07	80996	TRUE	1.49E-02
	rs6943160	C	T	0.0206	0.2086	3.10E-08	0.0037	C	T	-0.0093	0.2230	7.18E-01	0.0257	7	99873778	6.62E-05	30.618	6.62E-05	462346	1.62E-06	80996	TRUE	7.15E-02
	rs9648478	A	G	0.0169	0.5102	2.60E-08	0.0030	A	G	-0.0135	0.5046	5.26E-01	0.0212	7	39325802	6.70E-05	30.985	6.70E-05	462346	5.01E-06	80996	TRUE	1.18E-01
	rs11787216	T	C	0.0244	0.3691	2.40E-14	0.0032	T	C	0.0102	0.3542	6.46E-01	0.0222	8	142615222	1.26E-04	58.189	1.26E-04	462346	2.61E-06	80996	TRUE	1.17E-02
	rs2977454	G	C	-0.0259	0.1241	1.70E-08	0.0046	G	C	-0.0441	0.1665	1.25E-01	0.0287	8	141539923	6.87E-05	31.776	6.87E-05	462346	2.92E-05	80996	TRUE	4.48E-01
	rs34440851	T	C	-0.0227	0.1572	4.60E-08	0.0042	T	C	0.0567	0.2287	2.39E-02	0.0251	8	87214346	6.46E-05	29.867	6.46E-05	462346	6.30E-05	80996	TRUE	9.79E-01
	rs34473884	A	G	-0.0204	0.2482	6.20E-09	0.0035	A	G	-0.0244	0.2280	3.34E-01	0.0252	10	133761285	7.31E-05	33.777	7.31E-05	462346	1.16E-05	80996	TRUE	1.77E-01
	rs4242715	A	G	-0.0187	0.6806	9.30E-09	0.0032	A	G	-0.0079	0.5922	7.17E-01	0.0218	10	133986135	7.13E-05	32.979	7.13E-05	462346	1.62E-06	80996	TRUE	5.97E-02
	rs10792669	G	A	0.0174	0.5053	9.90E-09	0.0030	G	A	-0.0108	0.4630	6.14E-01	0.0214	11	82688356	7.11E-05	32.868	7.11E-05	462346	3.14E-06	80996	TRUE	8.05E-02
	rs11223617	A	G	0.0251	0.2062	2.30E-11	0.0038	A	G	0.0113	0.2963	6.29E-01	0.0234	11	133780757	9.66E-05	44.677	9.66E-05	462346	2.88E-06	80996	TRUE	3.27E-02
	rs1666658	C	T	0.0180	0.3922	6.70E-09	0.0031	C	T	-0.0291	0.3942	1.82E-01	0.0218	11	121801129	7.27E-05	33.622	7.27E-05	462346	2.20E-05	80996	TRUE	3.14E-01
	rs550942	T	C	0.0224	0.8239	2.00E-08	0.0040	T	C	0.0147	0.8991	6.76E-01	0.0352	11	58394154	6.82E-05	31.538	6.82E-05	462346	2.15E-06	80996	TRUE	7.46E-02
	rs12312693	C	T	-0.0177	0.4518	6.80E-09	0.0031	C	T	-0.0399	0.4830	6.23E-02	0.0214	12	57511734	7.27E-05	33.600	7.27E-05	462346	4.29E-05	80996	TRUE	6.04E-01
	rs28768122	C	T	0.0207	0.7595	5.60E-09	0.0036	C	T	0.0211	0.7592	4.01E-01	0.0251	12	123885974	7.34E-05	33.961	7.34E-05	462346	8.72E-06	80996	TRUE	1.40E-01
	rs58905411	A	G	-0.0266	0.4101	5.10E-18	0.0031	A	G	-0.0370	0.4786	8.60E-02	0.0215	12	54623132	1.62E-04	74.853	1.62E-04	462346	3.66E-05	80996	TRUE	7.96E-02
	rs7298932	G	A	-0.0237	0.1478	3.80E-08	0.0043	G	A	0.0612	0.1248	5.99E-02	0.0325	12	23727301	6.55E-05	30.268	6.55E-05	462346	4.38E-05	80996	TRUE	6.99E-01
	rs1937522	G	A	0.0169	0.5281	2.50E-08	0.0030	G	A	-0.0181	0.4719	3.96E-01	0.0213	13	68080817	6.72E-05	31.059	6.72E-05	462346	8.92E-06	80996	TRUE	1.71E-01
	rs7330939	T	C	-0.0213	0.7204	3.70E-10	0.0034	T	C	-0.0129	0.6624	5.69E-01	0.0226	13	49971400	8.49E-05	39.251	8.49E-05	462346	4.02E-06	80996	TRUE	5.84E-02
	rs186347	T	G	0.0179	0.4633	4.00E-09	0.0031	T	G	0.0020	0.4427	9.25E-01	0.0215	14	59072226	7.49E-05	34.616	7.49E-05	462346	1.07E-07	80996	TRUE	2.88E-02
	rs2535911	T	C	-0.0188	0.3547	2.70E-09	0.0032	T	C	0.0007	0.4359	9.74E-01	0.0215	14	73523162	7.65E-05	35.384	7.65E-05	462346	1.31E-08	80996	TRUE	2.34E-02
	rs80292319	C	T	-0.0394	0.0577	1.40E-09	0.0065	C	T	-0.0077	0.0812	8.44E-01	0.0391	15	76508632	7.95E-05	36.739	7.95E-05	462346	4.79E-07	80996	TRUE	3.09E-02
	rs34631026	T	C	-0.0169	0.4461	2.90E-08	0.0030	T	C	-0.0162	0.3368	4.69E-01	0.0224	16	6172126	6.66E-05	30.783	6.66E-05	462346	6.46E-06	80996	TRUE	1.40E-01
	rs72787062	A	G	-0.0282	0.1628	6.40E-12	0.0041	A	G	-0.0255	0.1475	4.06E-01	0.0306	16	72105844	1.02E-04	47.215	1.02E-04	462346	8.57E-06	80996	TRUE	5.95E-02
	rs728538	G	T	0.0229	0.1689	1.80E-08	0.0041	G	T	-0.0084	0.1910	7.61E-01	0.0274	16	51205819	6.86E-05	31.705	6.86E-05	462346	1.16E-06	80996	TRUE	5.86E-02
	rs8043563	C	G	0.0234	0.7372	1.70E-11	0.0035	C	G	-0.0359	0.7248	1.35E-01	0.024	16	19982353	9.80E-05	45.308	9.80E-05	462346	2.76E-05	80996	TRUE	2.23E-01
	rs17690703	T	C	0.0250	0.2627	2.90E-13	0.0034	T	C	-0.0953	0.1191	3.50E-03	0.0326	17	43925297	1.15E-04	53.263	1.15E-04	462346	1.05E-04	80996	TRUE	9.04E-01
	rs4968391	T	G	-0.0193	0.6749	2.30E-09	0.0032	T	G	-0.0309	0.6071	1.57E-01	0.0218	17	57780943	7.71E-05	35.668	7.71E-05	462346	2.48E-05	80996	TRUE	3.18E-01
	rs650558	T	C	0.0207	0.2479	3.40E-09	0.0035	T	C	0.0138	0.2133	5.96E-01	0.026	17	40721042	7.56E-05	34.943	7.56E-05	462346	3.48E-06	80996	TRUE	7.30E-02
	rs8614	A	C	0.0248	0.1825	2.70E-10	0.0039	A	C	-0.0519	0.1548	8.01E-02	0.0296	17	27588806	8.62E-05	39.853	8.62E-05	462346	3.80E-05	80996	TRUE	4.12E-01
	rs9906502	A	G	0.0238	0.1770	1.90E-09	0.0040	A	G	0.0376	0.1956	1.63E-01	0.0269	17	7615745	7.80E-05	36.053	7.80E-05	462346	2.41E-05	80996	TRUE	3.04E-01
	rs9912298	C	A	0.0206	0.2396	9.70E-09	0.0036	C	A	-0.0102	0.2090	6.96E-01	0.0261	17	29735752	7.11E-05	32.894	7.11E-05	462346	1.89E-06	80996	TRUE	6.38E-02
	rs2043677	T	C	0.0261	0.1456	1.60E-09	0.0043	T	C	-0.0152	0.1497	6.13E-01	0.0301	18	38328207	7.88E-05	36.417	7.88E-05	462346	3.15E-06	80996	TRUE	6.23E-02
	rs2924321	A	G	-0.0195	0.5396	1.60E-10	0.0031	A	G	0.0144	0.6318	5.17E-01	0.0222	18	53125435	8.85E-05	40.925	8.85E-05	462346	5.19E-06	80996	TRUE	6.13E-02
	rs5022348	T	C	0.0203	0.4070	1.40E-08	0.0036	T	C	0.0256	0.5340	2.30E-01	0.0213	18	22639237	6.97E-05	32.218	6.97E-05	462346	1.78E-05	80996	TRUE	2.79E-01
	rs6030200	A	G	-0.0195	0.3142	2.40E-09	0.0033	A	G	-0.0317	0.4108	1.43E-01	0.0216	20	35554361	7.71E-05	35.650	7.71E-05	462346	2.66E-05	80996	TRUE	3.41E-01
	rs11700855	G	A	-0.0298	0.0935	1.20E-08	0.0052	G	A	-0.0567	0.1179	8.61E-02	0.033	21	34270051	7.01E-05	32.419	7.01E-05	462346	3.64E-05	80996	TRUE	5.40E-01
	rs71651683	T	C	-0.0705	0.0142	3.60E-08	0.0128	T	C	0.0056	0.0072	9.66E-01	0.1317	22	24828853	6.56E-05	30.345	6.56E-05	462346	2.23E-08	80996	TRUE	3.68E-02
Average weekly red wine intake	rs10925183	A	G	-0.0119	0.6074	1.60E-08	0.0021	A	G	-0.0495	0.6194	2.42E-02	0.022	1	236812414	9.75E-05	31.874	9.75E-05	327026	6.25E-05	80996	TRUE	6.16E-01
	rs35698271	C	A	-0.0153	0.1803	1.30E-08	0.0027	C	A	-0.0169	0.1613	5.58E-01	0.0289	1	96256387	9.90E-05	32.385	9.90E-05	327026	4.22E-06	80996	TRUE	4.42E-02
	rs11714337	A	G	0.0124	0.4331	2.90E-09	0.0021	A	G	0.0377	0.3941	8.44E-02	0.0218	3	71582521	1.08E-04	35.218	1.08E-04	327026	3.69E-05	80996	TRUE	2.73E-01

	rs11715683	A	T	0.0140	0.3449	1.30E-10	0.0022	A	T	-0.0526	0.3479	1.87E-02	0.0224	3	85372128	1.26E-04	41.358	1.26E-04	327026	6.81E-05	80996	TRUE	4.45E-01
	rs4643716	A	C	0.0115	0.5837	4.30E-08	0.0021	A	C	0.0016	0.5033	9.40E-01	0.0213	3	117178744	9.17E-05	30.001	9.17E-05	327026	6.97E-08	80996	TRUE	1.76E-02
	rs6908328	A	C	0.0127	0.5140	7.20E-10	0.0021	A	C	0.0157	0.6248	4.81E-01	0.0223	6	26303319	1.16E-04	37.974	1.16E-04	327026	6.12E-06	80996	TRUE	3.44E-02
	rs55968191	A	G	0.0132	0.2469	4.70E-08	0.0024	A	G	0.0412	0.2132	1.16E-01	0.0262	8	142705706	9.13E-05	29.855	9.13E-05	327026	3.05E-05	80996	TRUE	3.05E-01
	rs62573521	T	C	-0.0323	0.0405	7.50E-10	0.0052	T	C	0.0035	0.0143	9.69E-01	0.0891	9	22648200	1.16E-04	37.888	1.16E-04	327026	1.91E-08	80996	TRUE	6.79E-03
	rs898751	T	C	-0.0124	0.4920	2.10E-09	0.0021	T	C	-0.0110	0.5407	6.07E-01	0.0213	17	2291863	1.10E-04	35.869	1.10E-04	327026	3.29E-06	80996	TRUE	2.74E-02
	rs627685	C	T	-0.0125	0.3029	3.00E-08	0.0023	C	T	-0.0130	0.2652	5.92E-01	0.0242	18	53186092	9.40E-05	30.738	9.40E-05	327026	3.56E-06	80996	TRUE	4.67E-02
Average weekly	rs13029509	A	G	-0.0124	0.4783	3.50E-09	0.0021	A	G	0.0156	0.4218	4.68E-01	0.0215	2	215374209	1.07E-04	34.866	1.07E-04	326801	6.50E-06	80996	TRUE	4.75E-02
champagne plus	rs174567	G	A	0.0120	0.3504	4.20E-08	0.0022	G	A	-0.0160	0.4166	4.60E-01	0.0216	11	61593005	9.19E-05	30.044	9.19E-05	326801	6.77E-06	80996	TRUE	7.51E-02
white wine intake	rs9912530	C	T	0.0134	0.7266	1.30E-08	0.0024	C	T	0.0486	0.8127	7.61E-02	0.0274	17	44836302	9.90E-05	32.355	9.90E-05	326801	3.88E-05	80996	TRUE	3.44E-01
Average weekly	rs61729488	C	T	-0.0230	0.1057	9.20E-11	0.0036	C	T	-0.0444	0.0905	2.32E-01	0.0372	3	49067904	1.29E-04	41.981	1.29E-04	326565	1.76E-05	80996	TRUE	6.88E-02
spirits intake	rs9299529	C	T	0.0139	0.7426	2.50E-08	0.0025	C	T	-0.0740	0.8115	5.98E-03	0.0269	10	77570060	9.51E-05	31.056	9.51E-05	326565	9.34E-05	80996	TRUE	9.83E-01
	rs6488335	G	T	0.0125	0.4780	1.10E-08	0.0022	G	T	-0.0171	0.4013	4.33E-01	0.0217	12	11140483	9.98E-05	32.591	9.98E-05	326565	7.67E-06	80996	TRUE	6.58E-02
Average weekly	rs12046000	T	G	-0.0136	0.4473	2.50E-15	0.0017	T	G	-0.0532	0.3358	1.84E-02	0.0226	1	91192396	1.91E-04	62.613	1.91E-04	327634	6.84E-05	80996	TRUE	1.57E-01
beer plus cider	rs12135360	T	G	-0.0098	0.5630	1.50E-08	0.0017	T	G	0.0186	0.5151	3.83E-01	0.0213	1	72228302	9.76E-05	31.994	9.76E-05	327634	9.41E-06	80996	TRUE	8.25E-02
intake	rs143223375	G	C	-0.0266	0.0353	2.40E-08	0.0048	G	C	-0.0676	0.0313	2.86E-01	0.0633	2	207434727	9.50E-05	31.124	9.50E-05	327634	1.41E-05	80996	TRUE	1.27E-01
	rs1387695	G	T	0.0100	0.5750	9.20E-09	0.0017	G	T	0.0232	0.5878	2.88E-01	0.0218	3	159191889	1.01E-04	33.011	1.01E-04	327634	1.40E-05	80996	TRUE	1.08E-01
	rs13130794	C	T	-0.0120	0.3683	1.70E-11	0.0018	C	T	0.0109	0.3476	6.27E-01	0.0224	4	39422242	1.38E-04	45.237	1.38E-04	327634	2.92E-06	80996	TRUE	1.05E-02
	rs34178057	C	A	0.0165	0.0991	7.70E-09	0.0029	C	A	0.0346	0.1368	2.67E-01	0.0311	4	100268602	1.02E-04	33.358	1.02E-04	327634	1.53E-05	80996	TRUE	1.15E-01
	rs12513581	C	T	-0.0110	0.4798	1.30E-10	0.0017	C	T	-0.0083	0.4950	6.95E-01	0.0212	5	60533207	1.26E-04	41.260	1.26E-04	327634	1.89E-06	80996	TRUE	1.21E-02
	rs28478711	G	A	-0.0095	0.4753	3.40E-08	0.0017	G	A	-0.0159	0.5300	4.55E-01	0.0213	5	166842891	9.31E-05	30.492	9.31E-05	327634	6.88E-06	80996	TRUE	7.35E-02
	rs1520929	C	T	0.0120	0.4489	3.80E-12	0.0017	C	T	-0.0329	0.5282	1.23E-01	0.0213	8	64700949	1.47E-04	48.227	1.47E-04	327634	2.95E-05	80996	TRUE	8.75E-02
	rs7851830	G	A	-0.0133	0.2344	4.50E-11	0.0020	G	A	-0.0451	0.2230	7.70E-02	0.0255	9	109380084	1.32E-04	43.404	1.32E-04	327634	3.86E-05	80996	TRUE	1.77E-01
	rs8044722	T	G	-0.0100	0.3788	1.30E-08	0.0018	T	G	-0.0179	0.3474	4.22E-01	0.0223	16	23878119	9.88E-05	32.360	9.88E-05	327634	7.95E-06	80996	TRUE	6.97E-02
	rs75413320	C	T	0.0166	0.1081	2.00E-09	0.0028	C	T	0.0286	0.0789	4.67E-01	0.0394	19	13149854	1.10E-04	35.954	1.10E-04	327634	6.51E-06	80996	TRUE	4.34E-02
Processed meat	rs11887120	T	C	0.0120	0.3977	3.10E-08	0.0022	T	C	0.0036	0.4523	8.67E-01	0.0216	2	25485735	6.64E-05	30.657	6.64E-05	461981	3.43E-07	80996	TRUE	4.72E-02
intake	rs11894162	T	C	0.0120	0.5475	1.10E-08	0.0021	T	C	-0.0176	0.4975	4.11E-01	0.0214	2	107197420	7.08E-05	32.702	7.08E-05	461981	8.35E-06	80996	TRUE	1.47E-01
	rs3762621	T	C	-0.0150	0.1835	3.60E-08	0.0027	T	C	-0.0264	0.1595	3.63E-01	0.029	2	173306140	6.57E-05	30.377	6.58E-05	461981	1.02E-05	80996	TRUE	1.97E-01
	rs4077924	C	T	0.0125	0.7019	4.50E-08	0.0023	C	T	0.0017	0.7171	9.44E-01	0.0236	2	181991389	6.48E-05	29.928	6.48E-05	461981	6.41E-08	80996	TRUE	4.07E-02
	rs2873054	C	A	0.0140	0.3533	1.60E-10	0.0022	C	A	-0.0093	0.4434	6.62E-01	0.0214	3	81888255	8.84E-05	40.847	8.84E-05	461981	2.33E-06	80996	TRUE	3.87E-02
	rs6765179	A	G	-0.0128	0.3100	1.80E-08	0.0023	A	G	0.0347	0.3972	1.12E-01	0.0218	3	25276416	6.86E-05	31.709	6.86E-05	461981	3.13E-05	80996	TRUE	4.80E-01
	rs6786550	C	T	0.0122	0.6350	2.10E-08	0.0022	C	T	0.0236	0.5820	2.71E-01	0.0214	3	62560523	6.80E-05	31.423	6.80E-05	461981	1.50E-05	80996	TRUE	2.51E-01
	rs9809856	G	A	0.0133	0.4759	2.50E-10	0.0021	G	A	-0.0244	0.5232	2.49E-01	0.0212	3	18227421	8.67E-05	40.055	8.67E-05	461981	1.64E-05	80996	TRUE	1.67E-01
	rs10454812	C	A	-0.0200	0.1030	6.70E-09	0.0034	C	A	0.0469	0.1107	1.67E-01	0.034	5	52800358	7.28E-05	33.626	7.28E-05	461981	2.35E-05	80996	TRUE	3.33E-01
	rs2029401	G	A	0.0146	0.5862	6.30E-12	0.0021	G	A	-0.0303	0.5733	1.64E-01	0.0217	5	92891029	1.02E-04	47.220	1.02E-04	461981	2.41E-05	80996	TRUE	1.72E-01
	rs6961970	A	C	-0.0140	0.2447	9.50E-09	0.0024	A	C	0.0311	0.2248	2.22E-01	0.0255	7	113901132	7.13E-05	32.951	7.13E-05	461981	1.84E-05	80996	TRUE	2.75E-01
	rs11032380	T	A	-0.0133	0.3334	2.10E-09	0.0022	T	A	0.0441	0.2335	7.85E-02	0.0251	11	33800533	7.77E-05	35.920	7.77E-05	461981	3.81E-05	80996	TRUE	4.88E-01
	rs6484504	C	T	0.0155	0.7246	4.40E-11	0.0023	C	T	0.0126	0.6511	5.74E-01	0.0224	11	31424823	9.40E-05	43.429	9.40E-05	461981	3.91E-06	80996	TRUE	4.27E-02
	rs4778053	G	C	0.0165	0.8438	1.30E-08	0.0029	G	C	-0.0208	0.7568	4.01E-01	0.0247	15	93424341	6.98E-05	32.270	6.98E-05	461981	8.76E-06	80996	TRUE	1.56E-01
	rs34241936	G	A	0.0328	0.0374	1.10E-08	0.0058	G	A	0.0191	0.0396	7.30E-01	0.0554	17	74065908	7.05E-05	32.574	7.05E-05	461981	1.47E-06	80996	TRUE	5.93E-02

	rs8096167	C	T	-0.0146	0.1926	4.70E-08	0.0027	C	T	-0.0237	0.1722	4.00E-01	0.0282	18	34800257	6.46E-05	29.856	6.46E-05	461981	8.72E-06	80996	TRUE	1.82E-01
	rs6010651	C	A	-0.0124	0.3794	1.10E-08	0.0022	C	A	0.0008	0.3780	9.69E-01	0.0219	20	62418243	7.09E-05	32.746	7.09E-05	461981	1.65E-08	80996	TRUE	2.95E-02
	rs203319	T	C	-0.0164	0.2046	2.80E-10	0.0026	T	C	-0.0026	0.2538	9.14E-01	0.0245	22	41914593	8.62E-05	39.841	8.62E-05	461981	1.39E-07	80996	TRUE	1.93E-02
Poultry intake	rs9923768	A	G	0.0105	0.5985	1.60E-08	0.0019	A	G	-0.0239	0.5457	0.2639	0.0214	16	6163838	6.92E-05	31.977	6.92E-05	461900	1.54E-05	80996	TRUE	2.48E-01
	rs2565017	A	G	0.0110	0.3727	5.90E-09	0.0019	A	G	0.0097	0.3627	0.660201	0.022	18	21070280	7.33E-05	33.858	7.33E-05	461900	2.40E-06	80996	TRUE	6.57E-02
	rs2965200	A	G	-0.0104	0.6400	4.20E-08	0.0019	A	G	-0.0316	0.7309	0.1868	0.0239	19	19476365	6.50E-05	30.047	6.50E-05	461900	2.16E-05	80996	TRUE	3.69E-01
	rs2426440	G	A	0.0112	0.7326	4.70E-08	0.0021	G	A	0.0056	0.7738	0.8252	0.0252	20	50999841	6.46E-05	29.849	6.46E-05	461900	6.10E-07	80996	TRUE	5.67E-02
Beef intake	rs1105388	T	C	-0.0114	0.3001	1.30E-09	0.0019	T	C	0.0002	0.2893	9.93E-01	0.0235	1	205308591	7.98E-05	36.782	7.98E-05	461053	8.94E-10	80996	TRUE	1.95E-02
	rs1470610	C	G	-0.0122	0.1962	1.50E-08	0.0022	C	G	-0.0059	0.1844	8.32E-01	0.0275	2	33866464	6.95E-05	32.050	6.95E-05	461053	5.68E-07	80996	TRUE	4.65E-02
	rs62169335	T	C	-0.0097	0.5432	2.40E-08	0.0017	T	C	-0.0121	0.5039	5.73E-01	0.0214	2	147946069	6.76E-05	31.160	6.76E-05	461053	3.95E-06	80996	TRUE	1.02E-01
	rs4676964	T	C	0.0134	0.5106	9.60E-15	0.0017	T	C	0.0046	0.4651	8.28E-01	0.0213	3	71034748	1.30E-04	59.967	1.30E-04	461053	5.76E-07	80996	TRUE	5.20E-03
	rs79809011	A	G	-0.0281	0.0295	3.40E-08	0.0051	A	G	-0.1348	0.0096	2.33E-01	0.113	8	10126532	6.60E-05	30.451	6.60E-05	461053	1.76E-05	80996	TRUE	3.02E-01
	rs10959890	C	T	-0.0127	0.2123	1.50E-09	0.0021	C	T	-0.0138	0.1663	6.28E-01	0.0284	9	11526198	7.92E-05	36.512	7.92E-05	461053	2.92E-06	80996	TRUE	5.91E-02
	rs784251	T	C	-0.0103	0.4776	1.70E-09	0.0017	T	C	-0.0418	0.4942	4.96E-02	0.0213	18	53412903	7.87E-05	36.277	7.87E-05	461053	4.75E-05	80996	TRUE	6.04E-01
	rs11878917	A	G	0.0150	0.1097	4.60E-08	0.0027	A	G	-0.0577	0.0650	1.83E-01	0.0433	19	42588999	6.48E-05	29.867	6.48E-05	461053	2.19E-05	80996	TRUE	3.77E-01
	rs132901	T	C	0.0139	0.7877	2.90E-11	0.0021	T	C	-0.0107	0.7635	6.69E-01	0.0251	22	41797547	9.60E-05	44.271	9.60E-05	461053	2.24E-06	80996	TRUE	2.93E-02
Non-oily fish intake	rs11680516	C	T	0.0123	0.2024	1.40E-09	0.0020	C	T	0.0399	0.1608	1.65E-01	0.0287	2	208205711	7.96E-05	36.680	7.96E-05	460880	2.39E-05	80996	TRUE	2.89E-01
	rs1260326	C	T	-0.0096	0.6042	7.90E-09	0.0017	C	T	-0.0225	0.6474	3.13E-01	0.0223	2	27730940	7.23E-05	33.310	7.23E-05	460880	1.26E-05	80996	TRUE	1.93E-01
	rs16822430	C	T	0.0116	0.2332	1.40E-09	0.0019	C	T	-0.0022	0.2727	9.28E-01	0.024	2	144147475	7.97E-05	36.720	7.97E-05	460880	1.04E-07	80996	TRUE	2.39E-02
	rs3799077	G	T	-0.0107	0.3100	1.00E-09	0.0018	G	T	0.0262	0.3195	2.53E-01	0.0229	6	69996217	8.09E-05	37.300	8.09E-05	460880	1.62E-05	80996	TRUE	1.92E-01
	rs4318925	T	C	-0.0150	0.1772	1.30E-12	0.0021	T	C	-0.0453	0.1527	1.50E-01	0.0314	6	32761506	1.09E-04	50.281	1.09E-04	460880	2.57E-05	80996	TRUE	1.58E-01
	rs17317920	G	A	0.0091	0.4792	2.80E-08	0.0016	G	A	0.0350	0.4101	1.08E-01	0.0217	7	25517103	6.69E-05	30.851	6.69E-05	460880	3.21E-05	80996	TRUE	5.09E-01
	rs6957745	C	T	-0.0122	0.2030	1.80E-09	0.0020	C	T	0.0036	0.1775	8.96E-01	0.0276	7	73056750	7.86E-05	36.233	7.86E-05	460880	2.10E-07	80996	TRUE	2.73E-02
	rs7148387	G	A	-0.0093	0.5907	1.70E-08	0.0017	G	A	0.0046	0.5804	8.31E-01	0.0216	14	29775132	6.90E-05	31.804	6.90E-05	460880	5.60E-07	80996	TRUE	4.73E-02
Oily fish intake	rs45501495	T	C	0.0157	0.2360	3.70E-12	0.0023	T	C	0.0676	0.2597	5.55E-03	0.0244	1	204596454	1.05E-04	48.261	1.05E-04	460443	9.48E-05	80996	TRUE	8.95E-01
	rs973526	T	C	-0.0115	0.5133	2.50E-09	0.0019	T	C	-0.0411	0.4612	5.50E-02	0.0214	1	72556393	7.72E-05	35.561	7.72E-05	460443	4.55E-05	80996	TRUE	5.92E-01
	rs17050031	T	C	-0.0120	0.4801	3.50E-10	0.0019	T	C	0.0000	0.4367	1.00E+00	0.0215	2	59488019	8.55E-05	39.355	8.55E-05	460443	0.00E+00	80996	TRUE	1.53E-02
	rs275160	C	T	0.0121	0.7006	8.00E-09	0.0021	C	T	0.0043	0.6754	8.49E-01	0.0228	2	145967878	7.23E-05	33.272	7.23E-05	460443	4.39E-07	80996	TRUE	3.97E-02
	rs55930451	T	C	-0.0171	0.1080	2.90E-08	0.0031	T	C	0.0105	0.0786	7.91E-01	0.0396	2	49039237	6.68E-05	30.744	6.68E-05	460443	8.68E-07	80996	TRUE	5.74E-02
	rs55985303	A	G	0.0130	0.2411	6.60E-09	0.0022	A	G	-0.0050	0.2899	8.33E-01	0.0237	2	77224951	7.31E-05	33.657	7.31E-05	460443	5.50E-07	80996	TRUE	4.04E-02
	rs114497213	T	G	0.0273	0.0548	1.10E-10	0.0042	T	G	-0.0090	0.0371	8.71E-01	0.0552	3	115214586	9.03E-05	41.602	9.03E-05	460443	3.28E-07	80996	TRUE	1.91E-02
	rs1201289	G	T	-0.0107	0.3945	4.40E-08	0.0020	G	T	-0.0130	0.3169	5.66E-01	0.0227	3	176822676	6.51E-05	29.966	6.51E-05	460443	4.05E-06	80996	TRUE	1.12E-01
	rs1876245	C	T	0.0151	0.4315	5.00E-15	0.0019	C	T	0.0409	0.3958	6.05E-02	0.0218	3	71534763	1.33E-04	61.266	1.33E-04	460443	4.35E-05	80996	TRUE	1.95E-01
	rs905575	G	C	0.0139	0.8240	3.60E-08	0.0025	G	C	-0.0380	0.9109	3.06E-01	0.0371	3	147076253	6.59E-05	30.368	6.59E-05	460443	1.30E-05	80996	TRUE	2.35E-01
	rs9841174	C	T	0.0148	0.3739	8.50E-14	0.0020	C	T	0.0087	0.4982	6.86E-01	0.0214	3	167184878	1.21E-04	55.692	1.21E-04	460443	2.04E-06	80996	TRUE	1.20E-02
	rs7683782	G	C	0.0145	0.8334	1.90E-08	0.0026	G	C	0.0205	0.8587	5.01E-01	0.0305	4	14935830	6.87E-05	31.635	6.87E-05	460443	5.58E-06	80996	TRUE	1.20E-01
	rs10061973	T	G	-0.0109	0.5139	1.50E-08	0.0019	T	G	0.0117	0.4299	5.85E-01	0.0214	5	166811498	6.97E-05	32.081	6.97E-05	460443	3.69E-06	80996	TRUE	9.17E-02
	rs10076975	C	T	0.0112	0.3814	1.10E-08	0.0020	C	T	-0.0127	0.4777	5.53E-01	0.0214	5	164518993	7.09E-05	32.643	7.09E-05	460443	4.35E-06	80996	TRUE	9.64E-02
	rs12663865	A	G	0.0128	0.7582	1.10E-08	0.0022	A	G	-0.0079	0.7735	7.55E-01	0.0253	6	88103149	7.11E-05	32.732	7.11E-05	460443	1.20E-06	80996	TRUE	5.43E-02
	rs16891727	A	C	-0.0237	0.1298	6.80E-17	0.0028	A	C	-0.0484	0.0841	2.11E-01	0.0386	6	26488860	1.51E-04	69.740	1.51E-04	460443	1.94E-05	80996	TRUE	3.81E-02

	rs4869859	C	T	0.0140	0.4499	3.10E-13	0.0019	C	T	0.0058	0.4832	7.86E-01	0.0214	6	155847549	1.15E-04	53.128	1.15E-04	460443	9.07E-07	80996	TRUE	1.02E-02
	rs11767283	G	A	0.0177	0.2217	2.50E-14	0.0023	G	A	-0.0368	0.2840	1.25E-01	0.024	7	121947456	1.26E-04	58.060	1.26E-04	460443	2.90E-05	80996	TRUE	1.25E-01
	rs6465487	G	A	-0.0124	0.3998	2.70E-10	0.0020	G	A	0.0011	0.4151	9.58E-01	0.0216	7	95760694	8.66E-05	39.876	8.66E-05	460443	3.20E-08	80996	TRUE	1.66E-02
	rs552234	A	G	-0.0116	0.4954	1.10E-09	0.0019	A	G	0.0356	0.4836	9.45E-02	0.0213	9	106772283	8.05E-05	37.089	8.05E-05	460443	3.45E-05	80996	TRUE	4.16E-01
	rs703987	C	G	0.0111	0.6150	1.70E-08	0.0020	C	G	0.0095	0.6766	6.79E-01	0.0229	10	80939219	6.90E-05	31.756	6.90E-05	460443	2.12E-06	80996	TRUE	7.23E-02
	rs2374424	G	A	-0.0114	0.6015	4.90E-09	0.0020	G	A	-0.0228	0.6463	3.04E-01	0.0222	11	83187113	7.43E-05	34.226	7.43E-05	460443	1.30E-05	80996	TRUE	1.88E-01
	rs4278546	G	A	0.0126	0.4411	9.30E-11	0.0019	G	A	-0.0020	0.3955	9.28E-01	0.0219	11	79226201	9.11E-05	41.969	9.11E-05	460443	1.03E-07	80996	TRUE	1.55E-02
	rs61882686	A	C	0.0198	0.0852	8.00E-09	0.0034	A	C	-0.0255	0.0788	5.16E-01	0.0393	11	46390680	7.22E-05	33.264	7.22E-05	460443	5.20E-06	80996	TRUE	1.03E-01
	rs631490	C	G	-0.0151	0.7091	6.00E-13	0.0021	C	G	-0.0547	0.7601	2.73E-02	0.0248	11	111452040	1.13E-04	51.851	1.13E-04	460443	6.01E-05	80996	TRUE	4.53E-01
	rs303817	G	A	0.0136	0.7511	8.00E-10	0.0022	G	A	0.0392	0.7319	1.04E-01	0.0241	12	52176235	8.20E-05	37.770	8.20E-05	460443	3.27E-05	80996	TRUE	3.80E-01
	rs1361016	G	T	0.0150	0.8449	1.70E-08	0.0027	G	T	-0.0593	0.8635	5.44E-02	0.0308	13	54220229	6.90E-05	31.784	6.90E-05	460443	4.58E-05	80996	TRUE	6.85E-01
	rs3124402	G	A	-0.0220	0.7333	1.90E-24	0.0022	G	A	0.0001	0.7659	9.96E-01	0.025	13	55975115	2.26E-04	104.087	2.26E-04	460443	1.98E-10	80996	TRUE	8.08E-05
	rs9301837	A	C	-0.0157	0.1433	8.10E-09	0.0027	A	C	-0.0066	0.2362	7.95E-01	0.0253	13	93477312	7.22E-05	33.242	7.22E-05	460443	8.40E-07	80996	TRUE	4.67E-02
	rs9597870	G	T	-0.0127	0.2458	1.10E-08	0.0022	G	T	-0.0067	0.2245	7.93E-01	0.0255	13	59412819	7.09E-05	32.650	7.09E-05	460443	8.52E-07	80996	TRUE	4.91E-02
	rs12896749	C	G	-0.0110	0.3847	2.50E-08	0.0020	C	G	-0.0150	0.3457	5.02E-01	0.0224	14	100279492	6.75E-05	31.099	6.75E-05	460443	5.54E-06	80996	TRUE	1.24E-01
	rs4982738	A	G	0.0109	0.5829	3.50E-08	0.0020	A	G	-0.0024	0.6058	9.12E-01	0.022	14	23650191	6.60E-05	30.414	6.60E-05	460443	1.47E-07	80996	TRUE	4.21E-02
	rs28533540	A	G	0.0146	0.5342	2.80E-14	0.0019	A	G	0.0320	0.5729	1.36E-01	0.0215	15	47867762	1.26E-04	57.869	1.26E-04	460443	2.74E-05	80996	TRUE	1.17E-01
	rs11859365	C	A	0.0226	0.2538	9.40E-25	0.0022	C	A	-0.0220	0.3195	3.39E-01	0.023	16	83683945	2.29E-04	105.527	2.29E-04	460443	1.13E-05	80996	TRUE	2.00E-03
	rs9889161	T	G	-0.0133	0.3579	2.80E-11	0.0020	T	G	-0.0020	0.2828	9.34E-01	0.0237	16	51495068	9.62E-05	44.290	9.62E-05	460443	8.79E-08	80996	TRUE	1.26E-02
	rs28623270	T	A	-0.0178	0.1487	7.30E-11	0.0027	T	A	0.0083	0.1192	8.01E-01	0.0329	17	29389026	9.22E-05	42.437	9.22E-05	460443	7.86E-07	80996	TRUE	2.22E-02
	rs2952140	T	C	-0.0107	0.4826	2.50E-08	0.0019	T	C	0.0343	0.4289	1.10E-01	0.0215	17	37928059	6.75E-05	31.087	6.75E-05	460443	3.14E-05	80996	TRUE	4.93E-01
	rs4510068	T	G	-0.0130	0.4028	4.00E-11	0.0020	T	G	-0.0438	0.3706	4.74E-02	0.0221	17	44184828	9.47E-05	43.601	9.47E-05	460443	4.85E-05	80996	TRUE	4.68E-01
	rs59355765	T	C	-0.0163	0.1601	4.70E-10	0.0026	T	C	-0.0071	0.1188	8.28E-01	0.0326	18	53431951	8.42E-05	38.784	8.42E-05	460443	5.86E-07	80996	TRUE	2.73E-02
	rs7243428	G	A	-0.0130	0.2246	1.50E-08	0.0023	G	A	-0.0173	0.2029	5.10E-01	0.0263	18	35156177	6.96E-05	32.060	6.96E-05	460443	5.34E-06	80996	TRUE	1.13E-01
	rs4002471	T	C	-0.0192	0.5474	1.50E-23	0.0019	T	C	-0.0625	0.4305	3.54E-03	0.0214	19	49215095	2.17E-04	99.999	2.17E-04	460443	1.05E-04	80996	TRUE	2.40E-01
	rs7254235	G	A	-0.0106	0.5773	4.30E-08	0.0019	G	A	-0.0267	0.6949	2.46E-01	0.023	19	22212505	6.52E-05	30.022	6.52E-05	460443	1.66E-05	80996	TRUE	2.94E-01
	rs6033437	A	C	0.0125	0.2573	1.70E-08	0.0022	A	C	-0.0137	0.2082	6.02E-01	0.0262	20	12495731	6.91E-05	31.836	6.91E-05	460443	3.38E-06	80996	TRUE	8.91E-02
	rs6059844	G	A	0.0110	0.4951	9.20E-09	0.0019	G	A	-0.0061	0.5776	7.76E-01	0.0215	20	33036482	7.17E-05	33.012	7.17E-05	460443	9.94E-07	80996	TRUE	4.99E-02
	rs6089753	T	C	-0.0115	0.5310	1.80E-09	0.0019	T	C	-0.0499	0.5622	2.01E-02	0.0214	20	61154107	7.86E-05	36.198	7.86E-05	460443	6.71E-05	80996	TRUE	8.60E-01
	rs2827161	G	T	0.0107	0.4228	3.20E-08	0.0019	G	T	0.0107	0.3428	6.34E-01	0.0224	21	23340050	6.64E-05	30.574	6.64E-05	460443	2.82E-06	80996	TRUE	8.95E-02
	rs9606833	C	T	0.0170	0.2436	2.70E-14	0.0022	C	T	0.0061	0.2419	8.07E-01	0.0251	22	31750013	1.26E-04	57.971	1.26E-04	460443	7.29E-07	80996	TRUE	6.52E-03
Pork intake	rs11211124	C	T	-0.0100	0.2306	1.40E-08	0.0018	C	T	-0.0142	0.1882	6.04E-01	0.0273	1	45962409	7.00E-05	32.195	7.00E-05	460162	3.34E-06	80996	TRUE	8.63E-02
	rs9973426	G	A	0.0111	0.1766	1.00E-08	0.0019	G	A	-0.0070	0.1337	8.21E-01	0.0309	2	155751852	7.12E-05	32.756	7.12E-05	460162	6.34E-07	80996	TRUE	4.49E-02
	rs7641973	A	G	0.0084	0.3534	4.20E-08	0.0015	A	G	-0.0093	0.4433	6.64E-01	0.0214	3	81910489	6.53E-05	30.042	6.53E-05	460162	2.33E-06	80996	TRUE	8.55E-02
	rs254152	G	C	-0.0104	0.2350	2.20E-09	0.0017	G	C	-0.0190	0.2276	4.56E-01	0.0255	5	115641827	7.78E-05	35.818	7.78E-05	460162	6.85E-06	80996	TRUE	1.03E-01
	rs10972033	T	G	0.0090	0.4564	1.30E-09	0.0015	T	G	0.0093	0.4078	6.67E-01	0.0217	9	34269732	8.01E-05	36.853	8.01E-05	460162	2.27E-06	80996	TRUE	5.08E-02
	rs34161520	G	C	0.0116	0.1604	9.60E-09	0.0020	G	C	-0.0375	0.1430	2.19E-01	0.0305	10	125127645	7.15E-05	32.911	7.15E-05	460162	1.87E-05	80996	TRUE	2.78E-01
	rs2387807	T	C	-0.0151	0.0779	4.10E-08	0.0027	T	C	-0.0289	0.1273	3.71E-01	0.0323	12	38446861	6.55E-05	30.124	6.55E-05	460162	9.88E-06	80996	TRUE	1.94E-01
	rs4146837	T	C	0.0088	0.4556	4.00E-09	0.0015	T	C	-0.0021	0.4000	9.24E-01	0.0217	15	93446869	7.52E-05	34.615	7.52E-05	460162	1.16E-07	80996	TRUE	2.88E-02
	rs36124222	C	T	0.0084	0.4332	2.10E-08	0.0015	C	T	0.0049	0.4662	8.20E-01	0.0215	18	74196202	6.82E-05	31.395	6.82E-05	460162	6.41E-07	80996	TRUE	5.03E-02

Lamb/mutton	rs56394517	G	A	-0.0138	0.0958	3.20E-08	0.0025	G	A	0.0436	0.0909	0.2381	0.037	1	243582753	6.65E-05	30.573	6.65E-05	460006	1.71E-05	80996	TRUE	2.92E-01
intake	rs660880	A	G	-0.0090	0.5128	6.80E-10	0.0015	A	G	0.0327	0.4936	0.124	0.0213	1	6866978	8.27E-05	38.064	8.27E-05	460006	2.91E-05	80996	TRUE	3.31E-01
	rs139237013	A	G	0.0189	0.0577	1.80E-09	0.0031	A	G	0.0874	0.0436	0.0889	0.0514	2	56662691	7.87E-05	36.224	7.87E-05	460006	3.57E-05	80996	TRUE	4.47E-01
	rs2222760	A	G	-0.0091	0.2809	2.80E-08	0.0016	A	G	-0.0370	0.2297	0.1444	0.0253	2	151345113	6.70E-05	30.844	6.70E-05	460006	2.64E-05	80996	TRUE	4.24E-01
	rs2678900	G	T	0.0101	0.4279	9.90E-12	0.0015	G	T	0.0407	0.3996	0.0620	0.0218	2	58177683	1.01E-04	46.353	1.01E-04	460006	4.30E-05	80996	TRUE	3.61E-01
	rs12634740	G	T	-0.0101	0.2521	2.80E-09	0.0017	G	T	0.0006	0.3018	0.9792	0.0233	3	175671450	7.68E-05	35.324	7.68E-05	460006	8.19E-09	80996	TRUE	2.29E-02
	rs6829572	A	G	0.0084	0.4567	1.20E-08	0.0015	A	G	-0.0165	0.3635	0.4571	0.0221	4	93984155	7.06E-05	32.481	7.06E-05	460006	6.88E-06	80996	TRUE	1.29E-01
	rs11743441	T	G	-0.0088	0.5743	2.70E-09	0.0015	T	G	-0.0026	0.5822	0.9025	0.0216	5	88065637	7.70E-05	35.408	7.70E-05	460006	1.79E-07	80996	TRUE	2.84E-02
	rs16891982	G	C	-0.0243	0.9721	2.70E-08	0.0044	G	C	-0.0397	0.9819	0.6227	0.0806	5	33951693	6.72E-05	30.919	6.72E-05	460006	3.00E-06	80996	TRUE	8.96E-02
	rs7447465	C	T	0.0096	0.6194	2.00E-10	0.0015	C	T	0.0008	0.6635	0.9719	0.0226	5	164566362	8.80E-05	40.474	8.80E-05	460006	1.55E-08	80996	TRUE	1.51E-02
	rs62398404	T	C	0.0129	0.1272	4.00E-09	0.0022	T	C	-0.0036	0.1353	0.9069	0.0311	6	37669616	7.53E-05	34.642	7.53E-05	460006	1.65E-07	80996	TRUE	3.00E-02
	rs35797675	G	T	-0.0108	0.2159	1.40E-09	0.0018	G	T	0.0036	0.1763	0.8974	0.0276	7	72883106	7.96E-05	36.601	7.96E-05	460006	2.10E-07	80996	TRUE	2.64E-02
	rs4272399	A	C	-0.0092	0.3215	4.50E-09	0.0016	A	C	-0.0307	0.3619	0.1643	0.0221	8	4836291	7.48E-05	34.406	7.48E-05	460006	2.38E-05	80996	TRUE	3.23E-01
	rs1556147	T	A	0.0091	0.6716	5.30E-09	0.0016	T	A	-0.0549	0.7512	0.0252	0.0245	9	131936055	7.41E-05	34.078	7.41E-05	460006	6.20E-05	80996	TRUE	8.47E-01
	rs4489752	T	G	0.0138	0.8360	2.80E-12	0.0020	T	G	-0.0059	0.8436	0.8388	0.0292	11	126590934	1.06E-04	48.858	1.06E-04	460006	5.04E-07	80996	TRUE	1.18E-02
	rs673696	T	C	0.0158	0.0810	3.70E-09	0.0027	T	C	-0.0162	0.0794	0.6777	0.0389	11	31097262	7.56E-05	34.796	7.56E-05	460006	2.14E-06	80996	TRUE	5.77E-02
	rs6581296	G	C	0.0100	0.7947	4.00E-08	0.0018	G	C	0.0310	0.7773	0.2287	0.0257	12	60473007	6.56E-05	30.166	6.56E-05	460006	1.80E-05	80996	TRUE	3.11E-01
	rs3105056	C	T	-0.0116	0.7327	1.80E-12	0.0016	C	T	0.0018	0.7652	0.941	0.025	13	55946152	1.08E-04	49.718	1.08E-04	460006	6.40E-08	80996	TRUE	7.77E-03
	rs1958801	G	A	-0.0089	0.2880	3.20E-08	0.0016	G	A	-0.0035	0.2240	0.8905	0.0255	14	98872110	6.65E-05	30.575	6.65E-05	460006	2.33E-07	80996	TRUE	4.41E-02
	rs2926119	A	C	0.0081	0.5694	4.40E-08	0.0015	A	C	-0.0179	0.5333	0.4007	0.0213	16	64293179	6.51E-05	29.964	6.51E-05	460006	8.72E-06	80996	TRUE	1.79E-01
	rs55813438	A	G	-0.0114	0.7632	4.70E-11	0.0017	A	G	0.0204	0.7837	0.4266	0.0257	16	5694999	9.41E-05	43.300	9.41E-05	460006	7.78E-06	80996	TRUE	6.97E-02
	rs17270057	C	T	0.0127	0.1133	4.30E-08	0.0023	C	T	-0.0528	0.0632	0.2286	0.0439	19	42670527	6.53E-05	30.031	6.53E-05	460006	1.79E-05	80996	TRUE	3.12E-01
	rs11090045	A	G	-0.0107	0.3071	3.00E-11	0.0016	A	G	-0.0072	0.3460	0.7484	0.0224	22	41753603	9.60E-05	44.159	9.60E-05	460006	1.28E-06	80996	TRUE	2.29E-02
	rs136548	T	C	0.0095	0.3767	2.90E-10	0.0015	T	C	-0.0111	0.4635	0.6033	0.0214	22	27253353	8.64E-05	39.732	8.64E-05	460006	3.32E-06	80996	TRUE	4.99E-02
Bread intake	rs9662365	T	C	0.0122	0.4995	9.60E-10	0.0020	T	C	0.0255	0.4640	0.2336	0.0214	1	98461443	8.27E-05	37.406	8.27E-05	452236	1.75E-05	80996	TRUE	1.98E-01
	rs13016665	A	C	0.0148	0.4232	3.50E-13	0.0020	A	C	0.0091	0.4719	0.6694	0.0214	2	57995348	1.17E-04	52.915	1.17E-04	452236	2.23E-06	80996	TRUE	1.46E-02
	rs13023099	A	C	-0.0115	0.5718	1.40E-08	0.0020	A	C	0.0138	0.4339	0.5220	0.0216	2	200705623	7.11E-05	32.155	7.11E-05	452236	5.04E-06	80996	TRUE	1.05E-01
	rs4665972	C	T	-0.0142	0.6045	3.20E-12	0.0020	C	T	-0.0428	0.6214	0.0513	0.022	2	27598097	1.07E-04	48.539	1.07E-04	452236	4.67E-05	80996	TRUE	3.56E-01
	rs75287965	A	G	-0.0247	0.0629	1.50E-09	0.0041	A	G	-0.0480	0.0550	0.3086	0.0471	2	44673517	8.07E-05	36.478	8.07E-05	452236	1.28E-05	80996	TRUE	1.57E-01
	rs9881332	G	C	0.0114	0.5818	1.90E-08	0.0020	G	C	-0.0514	0.6460	0.0205	0.0222	3	23241798	6.99E-05	31.624	6.99E-05	452236	6.62E-05	80996	TRUE	9.53E-01
	rs73802707	T	C	-0.0159	0.1537	8.00E-09	0.0028	T	C	0.0201	0.0848	0.5970	0.038	4	17932319	7.36E-05	33.271	7.36E-05	452236	3.45E-06	80996	TRUE	7.83E-02
	rs17083079	A	G	0.0301	0.0474	1.20E-10	0.0047	A	G	-0.1022	0.0129	0.2688	0.0924	5	92683607	9.16E-05	41.415	9.16E-05	452236	1.51E-05	80996	TRUE	1.36E-01
	rs2068650	C	A	-0.0139	0.4721	3.10E-12	0.0020	C	A	-0.0181	0.5309	0.3937	0.0213	5	166835294	1.07E-04	48.601	1.07E-04	452236	8.92E-06	80996	TRUE	5.31E-02
	rs2517678	T	C	0.0132	0.3684	2.20E-10	0.0021	T	C	-0.0223	0.3571	0.3328	0.023	6	29933225	8.90E-05	40.243	8.90E-05	452236	1.16E-05	80996	TRUE	1.14E-01
	rs596878	C	A	-0.0117	0.4496	5.30E-09	0.0020	C	A	-0.0054	0.3686	0.8079	0.022	6	140286236	7.54E-05	34.086	7.54E-05	452236	7.44E-07	80996	TRUE	4.04E-02
	rs7802468	T	C	-0.0234	0.3715	6.90E-30	0.0021	T	C	0.0280	0.3417	0.2145	0.0226	7	143704416	2.85E-04	128.974	2.85E-04	452236	1.90E-05	80996	TRUE	1.02E-03
	rs79436018	C	T	-0.0176	0.1163	1.60E-08	0.0031	C	T	0.0062	0.1094	0.8555	0.0342	7	127694032	7.06E-05	31.947	7.06E-05	452236	4.06E-07	80996	TRUE	4.18E-02
	rs10761661	T	C	-0.0115	0.4532	1.00E-08	0.0020	T	C	0.0011	0.4002	0.9602	0.0217	10	64525135	7.26E-05	32.818	7.26E-05	452236	3.17E-08	80996	TRUE	2.88E-02
	rs55745436	T	C	0.0134	0.2373	1.00E-08	0.0023	T	C	-0.0238	0.1623	0.4069	0.0287	10	63604734	7.26E-05	32.839	7.26E-05	452236	8.49E-06	80996	TRUE	1.42E-01
	rs1940033	T	C	-0.0111	0.5927	4.70E-08	0.0020	T	C	-0.0099	0.5701	0.6466	0.0215	11	131882807	6.60E-05	29.832	6.60E-05	452236	2.62E-06	80996	TRUE	8.83E-02

	rs11183201	C	T	-0.0167	0.5079	5.30E-17	0.0020	C	T	-0.0227	0.4951	0.285	0.0212	12	46170982	1.55E-04	70.230	1.55E-04	452236	1.42E-05	80996	TRUE	2.26E-02
	rs9529024	T	A	-0.0129	0.3704	4.20E-10	0.0021	T	A	-0.0168	0.4198	0.4366	0.0216	13	66713569	8.63E-05	39.016	8.63E-05	452236	7.47E-06	80996	TRUE	8.58E-02
	rs9564268	C	T	-0.0122	0.6156	3.00E-09	0.0020	C	T	-0.0411	0.5143	0.0561	0.0215	13	66208478	7.79E-05	35.212	7.79E-05	452236	4.51E-05	80996	TRUE	5.81E-01
	rs11628639	C	T	-0.0135	0.2433	6.20E-09	0.0023	C	T	-0.0207	0.1930	0.4390	0.0268	14	97837568	7.47E-05	33.769	7.47E-05	452236	7.37E-06	80996	TRUE	1.20E-01
	rs9323989	C	T	-0.0116	0.3792	1.60E-08	0.0021	C	T	-0.0021	0.3597	0.9252	0.0221	14	98587669	7.06E-05	31.927	7.06E-05	452236	1.11E-07	80996	TRUE	3.45E-02
	rs28406095	A	G	-0.0109	0.4617	4.40E-08	0.0020	A	G	-0.0177	0.5021	0.4046	0.0212	15	41825092	6.63E-05	29.966	6.63E-05	452236	8.61E-06	80996	TRUE	1.72E-01
	rs4984685	A	G	0.0136	0.2010	4.40E-08	0.0025	A	G	-0.0052	0.3151	0.8211	0.0228	16	754230	6.63E-05	29.986	6.63E-05	452236	6.42E-07	80996	TRUE	5.43E-02
	rs62091167	C	A	-0.0138	0.2159	1.20E-08	0.0024	C	A	-0.0430	0.2222	0.0948	0.0257	18	53130630	7.20E-05	32.565	7.20E-05	452236	3.46E-05	80996	TRUE	4.94E-01
	rs656817	G	A	-0.0127	0.3344	1.80E-09	0.0021	G	A	-0.0117	0.3045	0.6113	0.0231	18	40994935	8.00E-05	36.185	8.00E-05	452236	3.17E-06	80996	TRUE	6.04E-02
Cheese intake	rs2802530	A	G	0.0186	0.8765	4.20E-08	0.0034	A	G	0.0526	0.8471	7.33E-02	0.0294	1	98546134	6.66E-05	30.065	6.66E-05	451486	3.95E-05	80996	TRUE	6.23E-01
	rs531358	T	C	0.0132	0.6498	1.80E-08	0.0023	T	C	0.0078	0.6709	7.29E-01	0.0226	1	93676011	7.03E-05	31.733	7.03E-05	451486	1.47E-06	80996	TRUE	6.02E-02
	rs6685323	T	C	-0.0132	0.3093	4.80E-08	0.0024	T	C	-0.0060	0.3584	7.86E-01	0.0221	1	154295592	6.60E-05	29.801	6.60E-05	451486	9.10E-07	80996	TRUE	6.02E-02
	rs78876700	A	G	0.0181	0.1374	3.40E-08	0.0033	A	G	0.0370	0.0869	3.27E-01	0.0378	1	4670487	6.75E-05	30.467	6.75E-05	451486	1.18E-05	80996	TRUE	2.11E-01
	rs12475594	G	A	0.0160	0.1785	4.40E-08	0.0029	G	A	-0.0424	0.1966	1.13E-01	0.0268	2	58433375	6.63E-05	29.945	6.63E-05	451486	3.09E-05	80996	TRUE	4.98E-01
	rs1514755	G	A	0.0164	0.2396	3.90E-10	0.0026	G	A	0.0090	0.2963	7.01E-01	0.0235	2	166299635	8.67E-05	39.166	8.67E-05	451486	1.81E-06	80996	TRUE	3.68E-02
	rs2339928	A	G	0.0149	0.7041	1.20E-09	0.0024	A	G	-0.0131	0.7588	5.95E-01	0.0247	2	24049453	8.18E-05	36.929	8.18E-05	451486	3.47E-06	80996	TRUE	5.99E-02
	rs72970243	A	G	0.0222	0.1204	6.70E-11	0.0034	A	G	-0.0519	0.1648	7.00E-02	0.0287	2	136484232	9.43E-05	42.596	9.43E-05	451486	4.04E-05	80996	TRUE	3.79E-01
	rs4296548	G	T	0.0130	0.6096	1.20E-08	0.0023	G	T	-0.0073	0.5244	7.35E-01	0.0214	3	36915814	7.18E-05	32.410	7.18E-05	451486	1.44E-06	80996	TRUE	5.66E-02
	rs4681981	A	C	-0.0124	0.4691	2.90E-08	0.0022	A	C	0.0193	0.4896	3.62E-01	0.0212	3	56726105	6.82E-05	30.789	6.82E-05	451486	1.02E-05	80996	TRUE	1.85E-01
	rs62245792	A	T	-0.0179	0.1500	1.40E-08	0.0032	A	T	0.0211	0.2254	4.13E-01	0.0258	3	68410652	7.12E-05	32.145	7.12E-05	451486	8.26E-06	80996	TRUE	1.45E-01
	rs6774906	C	A	0.0316	0.0407	2.50E-08	0.0057	C	A	-0.0149	0.0409	7.87E-01	0.0552	3	194803510	6.89E-05	31.089	6.89E-05	451486	9.00E-07	80996	TRUE	5.41E-02
	rs77742462	G	A	-0.0475	0.0205	9.80E-09	0.0083	G	A	0.0511	0.0206	4.96E-01	0.0751	3	107637010	7.28E-05	32.879	7.28E-05	451486	5.72E-06	80996	TRUE	1.07E-01
	rs79184944	A	T	0.0196	0.1343	2.40E-09	0.0033	A	T	0.0220	0.2433	3.76E-01	0.0248	3	161549397	7.89E-05	35.615	7.89E-05	451486	9.72E-06	80996	TRUE	1.31E-01
	rs4692708	C	A	0.0147	0.2527	1.30E-08	0.0026	C	A	-0.0322	0.1860	2.40E-01	0.0274	4	170228542	7.17E-05	32.368	7.17E-05	451486	1.71E-05	80996	TRUE	2.56E-01
	rs4860341	C	T	0.0244	0.9287	2.20E-08	0.0044	C	T	0.0525	0.9114	1.62E-01	0.0375	4	61251106	6.94E-05	31.351	6.94E-05	451486	2.42E-05	80996	TRUE	3.71E-01
	rs73096946	C	T	-0.0206	0.1574	1.90E-11	0.0031	C	T	0.0570	0.0893	1.28E-01	0.0374	4	17788715	9.99E-05	45.086	9.99E-05	451486	2.87E-05	80996	TRUE	2.24E-01
	rs26579	C	G	-0.0128	0.5862	2.40E-08	0.0023	C	G	0.0046	0.6021	8.34E-01	0.0218	5	87985295	6.89E-05	31.130	6.89E-05	451486	5.50E-07	80996	TRUE	4.75E-02
	rs6873324	C	A	-0.0125	0.4258	3.90E-08	0.0023	C	A	0.0020	0.3935	9.26E-01	0.0218	5	153597288	6.69E-05	30.190	6.69E-05	451486	1.04E-07	80996	TRUE	3.96E-02
	rs1931805	C	T	0.0126	0.5001	1.60E-08	0.0022	C	T	0.0062	0.4443	7.72E-01	0.0215	6	62630863	7.07E-05	31.940	7.07E-05	451486	1.03E-06	80996	TRUE	5.26E-02
	rs9504123	C	A	0.0142	0.2747	1.50E-08	0.0025	C	A	-0.0135	0.2863	5.68E-01	0.0236	6	4478474	7.09E-05	32.030	7.09E-05	451486	4.04E-06	80996	TRUE	9.29E-02
	rs975303	G	A	0.0213	0.1813	2.50E-13	0.0029	G	A	0.0047	0.1516	8.76E-01	0.0299	6	19028788	1.19E-04	53.564	1.19E-04	451486	3.05E-07	80996	TRUE	6.74E-03
	rs113367286	T	C	0.0152	0.2785	1.30E-09	0.0025	T	C	-0.0121	0.3001	6.00E-01	0.0232	7	140144414	8.17E-05	36.872	8.17E-05	451486	3.36E-06	80996	TRUE	5.90E-02
	rs12672200	A	G	-0.0138	0.3258	9.00E-09	0.0024	A	G	0.0212	0.3546	3.45E-01	0.0225	7	115461436	7.32E-05	33.037	7.32E-05	451486	1.10E-05	80996	TRUE	1.69E-01
	rs34198643	T	C	-0.0167	0.2242	4.50E-10	0.0027	T	C	-0.0138	0.1615	6.33E-01	0.0288	7	2203808	8.61E-05	38.874	8.61E-05	451486	2.83E-06	80996	TRUE	4.65E-02
	rs13257887	C	T	0.0162	0.3589	2.70E-10	0.0026	C	T	0.0109	0.3339	7.59E-01	0.0355	8	10187716	8.83E-05	39.892	8.84E-05	451486	1.16E-06	80996	TRUE	2.92E-02
	rs7386207	T	C	-0.0125	0.5635	3.60E-08	0.0023	T	C	0.0348	0.6675	1.25E-01	0.0227	8	144246027	6.72E-05	30.330	6.72E-05	451486	2.90E-05	80996	TRUE	4.62E-01
	rs3911016	G	T	0.0214	0.1209	5.30E-10	0.0034	G	T	0.0535	0.1585	6.71E-02	0.0292	9	88029000	8.54E-05	38.548	8.54E-05	451486	4.14E-05	80996	TRUE	4.63E-01
	rs1806771	G	T	-0.0221	0.0879	4.10E-08	0.0040	G	T	0.0448	0.0785	2.62E-01	0.0399	10	63682387	6.67E-05	30.125	6.67E-05	451486	1.56E-05	80996	TRUE	2.68E-01
	rs73335955	C	T	0.0278	0.0533	2.40E-08	0.0050	C	T	0.0004	0.0401	9.94E-01	0.0525	10	106766879	6.89E-05	31.123	6.89E-05	451486	7.17E-10	80996	TRUE	3.01E-02
	rs12786959	T	A	-0.0161	0.1963	1.20E-08	0.0028	T	A	-0.0344	0.1657	2.35E-01	0.029	11	89943676	7.19E-05	32.481	7.19E-05	451486	1.74E-05	80996	TRUE	2.58E-01

	rs67238148	T	G	0.0165	0.2175	1.10E-09	0.0027	T	G	-0.0156	0.2072	5.56E-01	0.0265	11	7946480	8.23E-05	37.146	8.23E-05	451486	4.28E-06	80996	TRUE	6.65E-02
	rs73024305	C	G	0.0325	0.0548	4.00E-11	0.0049	C	G	-0.0319	0.0367	5.64E-01	0.0554	11	124942269	9.66E-05	43.608	9.66E-05	451486	4.09E-06	80996	TRUE	4.08E-02
	rs7936836	A	C	0.0159	0.4175	2.60E-12	0.0023	A	C	-0.0166	0.4182	4.43E-01	0.0217	11	43633645	1.08E-04	48.962	1.08E-04	451486	7.23E-06	80996	TRUE	4.29E-02
	rs12296440	A	G	0.0188	0.1697	2.80E-10	0.0030	A	G	0.0272	0.2227	2.88E-01	0.0256	12	49927148	8.81E-05	39.779	8.81E-05	451486	1.39E-05	80996	TRUE	1.38E-01
	rs524468	G	A	-0.0142	0.2606	2.40E-08	0.0026	G	A	-0.0019	0.3227	9.34E-01	0.0228	12	371786	6.90E-05	31.154	6.90E-05	451486	8.57E-08	80996	TRUE	3.57E-02
	rs61953351	T	G	0.0146	0.2504	1.50E-08	0.0026	T	G	0.0153	0.2833	5.17E-01	0.0236	12	121456616	7.09E-05	31.994	7.09E-05	451486	5.19E-06	80996	TRUE	1.08E-01
	rs7298331	C	A	-0.0132	0.6045	1.10E-08	0.0023	C	A	-0.0048	0.5082	8.21E-01	0.0214	12	22322789	7.23E-05	32.646	7.23E-05	451486	6.21E-07	80996	TRUE	4.32E-02
	rs1073242	A	G	0.0157	0.5538	6.70E-12	0.0023	A	G	0.0046	0.5509	8.32E-01	0.0216	13	58715219	1.04E-04	47.107	1.04E-04	451486	5.60E-07	80996	TRUE	1.31E-02
	rs11620149	C	T	-0.0177	0.1433	3.60E-08	0.0032	C	T	0.0260	0.1007	4.60E-01	0.0352	13	89816082	6.72E-05	30.345	6.72E-05	451486	6.74E-06	80996	TRUE	1.42E-01
	rs17115145	T	C	-0.0129	0.4013	1.80E-08	0.0023	T	C	-0.0357	0.4003	1.01E-01	0.0217	14	30122409	7.01E-05	31.649	7.01E-05	451486	3.34E-05	80996	TRUE	4.97E-01
	rs35270670	G	A	0.0164	0.2180	1.50E-09	0.0027	G	A	-0.0083	0.2214	7.44E-01	0.0255	15	83481880	8.09E-05	36.537	8.09E-05	451486	1.31E-06	80996	TRUE	3.96E-02
	rs61734410	T	C	0.0167	0.2552	2.20E-10	0.0026	T	C	0.0232	0.3284	3.09E-01	0.0228	16	1252369	8.93E-05	40.319	8.93E-05	451486	1.28E-05	80996	TRUE	1.24E-01
	rs71386942	A	C	0.0145	0.2689	9.90E-09	0.0025	A	C	-0.0227	0.2295	3.74E-01	0.0256	16	71992817	7.28E-05	32.851	7.28E-05	451486	9.71E-06	80996	TRUE	1.56E-01
	rs12951057	G	C	-0.0212	0.1656	3.60E-12	0.0030	G	C	-0.0351	0.2382	1.69E-01	0.0255	17	44794558	1.07E-04	48.309	1.07E-04	451486	2.34E-05	80996	TRUE	1.49E-01
	rs2854175	A	C	0.0170	0.2575	3.70E-11	0.0026	A	C	-0.0035	0.2237	8.89E-01	0.0253	17	61998469	9.69E-05	43.771	9.69E-05	451486	2.36E-07	80996	TRUE	1.42E-02
	rs919109	C	G	0.0199	0.1388	7.90E-10	0.0032	C	G	-0.0273	0.1714	3.34E-01	0.0282	17	46675977	8.37E-05	37.792	8.37E-05	451486	1.16E-05	80996	TRUE	1.32E-01
	rs1434511	T	C	0.0130	0.4553	9.50E-09	0.0023	T	C	-0.0121	0.5282	5.69E-01	0.0213	18	44829435	7.30E-05	32.946	7.30E-05	451486	3.98E-06	80996	TRUE	8.63E-02
	rs1291145	C	T	-0.0202	0.6858	4.40E-17	0.0024	C	T	0.0310	0.5889	1.52E-01	0.0216	20	35528475	1.56E-04	70.583	1.56E-04	451486	2.54E-05	80996	TRUE	5.06E-02
	rs62236533	A	G	0.0248	0.1088	1.10E-11	0.0036	A	G	0.0612	0.0529	1.97E-01	0.0474	22	41992169	1.02E-04	46.105	1.02E-04	451486	2.06E-05	80996	TRUE	1.44E-01
Cooked vegetable	rs2102738	C	A	-0.0122	0.1724	5.30E-09	0.0021	C	A	0.0209	0.1792	0.4533	0.0278	2	172525884	7.59E-05	34.066	7.59E-05	448651	6.98E-06	80996	TRUE	1.12E-01
intake	rs12629972	C	T	0.0118	0.5883	1.20E-13	0.0016	C	T	0.0264	0.6243	0.2318	0.022	3	25121444	1.23E-04	55.017	0.000122614	448651	1.78E-05	80996	TRUE	7.25E-02
	rs28450747	A	G	-0.0102	0.2326	4.30E-08	0.0019	A	G	0.0464	0.1969	0.0826	0.0267	4	42137653	6.69E-05	30.010	6.69E-05	448651	3.73E-05	80996	TRUE	5.87E-01
	rs1816263	C	T	0.0096	0.2802	3.70E-08	0.0017	C	T	0.0259	0.2605	0.2889	0.0244	5	141217079	6.75E-05	30.299	6.75E-05	448651	1.39E-05	80996	TRUE	2.40E-01
	rs2844672	A	G	-0.0096	0.6241	2.10E-09	0.0016	A	G	-0.0398	0.6161	0.0763	0.0224	6	31005139	8.00E-05	35.901	8.00E-05	448651	3.90E-05	80996	TRUE	4.79E-01
	rs10156602	G	A	0.0110	0.3614	1.80E-11	0.0016	G	A	-0.0053	0.4041	0.8088	0.0218	9	96345328	1.01E-04	45.212	0.000100764	448651	7.30E-07	80996	TRUE	1.61E-02
	rs11138705	C	G	0.0104	0.7572	1.40E-08	0.0018	C	G	0.0027	0.7711	0.9143	0.0254	9	83121545	7.16E-05	32.119	7.16E-05	448651	1.40E-07	80996	TRUE	3.41E-02
	rs2052063	T	C	-0.0095	0.5159	1.60E-09	0.0016	T	C	0.0173	0.5526	0.4176	0.0214	10	118040352	8.11E-05	36.385	8.11E-05	448651	8.07E-06	80996	TRUE	1.06E-01
	rs10161952	C	A	-0.0096	0.3127	1.30E-08	0.0017	C	A	-0.0177	0.3447	0.4268	0.0223	13	59474383	7.20E-05	32.289	7.20E-05	448651	7.78E-06	80996	TRUE	1.36E-01
	rs34155012	T	C	0.0106	0.2274	3.90E-08	0.0019	T	C	0.0185	0.1728	0.5123	0.0282	22	48977215	6.73E-05	30.175	6.73E-05	448651	5.31E-06	80996	TRUE	1.23E-01
Tea intake	rs11164870	G	C	-0.0120	0.6046	4.20E-08	0.0022	G	C	0.0168	0.6286	4.46E-01	0.022	1	93552187	6.71E-05	30.037	6.71E-05	447485	7.20E-06	80996	TRUE	1.49E-01
	rs11587444	G	A	0.0140	0.3935	1.00E-10	0.0022	G	A	-0.0078	0.4036	7.18E-01	0.0217	1	150722844	9.34E-05	41.788	9.34E-05	447485	1.60E-06	80996	TRUE	2.78E-02
	rs56188862	C	T	-0.0158	0.3875	4.30E-13	0.0022	C	T	-0.0023	0.3658	9.19E-01	0.022	1	174189269	1.17E-04	52.497	1.17E-04	447485	1.35E-07	80996	TRUE	6.14E-03
	rs1156588	G	A	-0.0155	0.2101	2.90E-09	0.0026	G	A	-0.0155	0.2242	5.44E-01	0.0256	2	58515375	7.87E-05	35.241	7.87E-05	447485	4.53E-06	80996	TRUE	7.73E-02
	rs2117137	G	A	0.0130	0.4051	1.70E-09	0.0022	G	A	0.0118	0.5001	5.79E-01	0.0212	3	89587262	8.12E-05	36.338	8.12E-05	447485	3.83E-06	80996	TRUE	6.46E-02
	rs57462170	A	G	0.0192	0.1088	1.90E-08	0.0034	A	G	0.0051	0.1422	8.67E-01	0.0305	3	50239803	7.07E-05	31.620	7.07E-05	447485	3.45E-07	80996	TRUE	4.06E-02
	rs1481012	G	A	-0.0262	0.1122	5.30E-15	0.0034	G	A	-0.0894	0.0745	2.73E-02	0.0405	4	89039082	1.37E-04	61.147	1.37E-04	447485	6.02E-05	80996	TRUE	3.03E-01
	rs34619	A	G	0.0117	0.4309	4.30E-08	0.0021	A	G	0.0205	0.4217	3.44E-01	0.0217	5	60465365	6.71E-05	30.021	6.71E-05	447485	1.10E-05	80996	TRUE	2.02E-01
	rs72797284	G	A	-0.0171	0.2708	7.00E-13	0.0024	G	A	0.0182	0.2090	4.84E-01	0.026	5	152031650	1.15E-04	51.558	1.15E-04	447485	6.05E-06	80996	TRUE	3.02E-02
	rs149805207	G	A	-0.0719	0.0085	1.10E-08	0.0126	G	A	-0.0365	0.0205	6.31E-01	0.076	6	137095269	7.30E-05	32.685	7.30E-05	447485	2.85E-06	80996	TRUE	7.25E-02
	rs2478875	G	A	0.0219	0.2088	5.10E-17	0.0026	G	A	0.0109	0.1725	6.97E-01	0.0279	6	51283110	1.57E-04	70.299	1.57E-04	447485	1.88E-06	80996	TRUE	3.47E-03

	rs7757102	G	A	-0.0118	0.5554	3.10E-08	0.0021	G	A	-0.0144	0.5671	5.03E-01	0.0215	6	137222671	6.84E-05	30.624	6.84E-05	447485	5.54E-06	80996	TRUE	1.21E-01
	rs141071726	A	G	0.0407	0.0267	2.20E-09	0.0068	A	G	0.0393	0.0140	6.66E-01	0.0911	7	17558580	7.99E-05	35.753	7.99E-05	447485	2.30E-06	80996	TRUE	5.19E-02
	rs17685	A	G	0.0231	0.2775	1.60E-22	0.0024	A	G	-0.0045	0.3809	8.39E-01	0.022	7	75616105	2.13E-04	95.364	2.13E-04	447485	5.17E-07	80996	TRUE	2.78E-04
	rs9648476	A	G	0.0125	0.6230	1.10E-08	0.0022	A	G	-0.0303	0.6395	1.72E-01	0.0222	7	39293033	7.31E-05	32.722	7.31E-05	447485	2.30E-05	80996	TRUE	3.25E-01
	rs13282783	T	C	-0.0136	0.2859	7.90E-09	0.0024	T	C	0.0077	0.4113	7.24E-01	0.0219	8	22088975	7.44E-05	33.289	7.44E-05	447485	1.53E-06	80996	TRUE	5.30E-02
	rs56348300	G	C	0.0159	0.1846	6.10E-09	0.0027	G	C	-0.0176	0.1305	5.74E-01	0.0314	9	7054124	7.55E-05	33.799	7.55E-05	447485	3.88E-06	80996	TRUE	7.84E-02
	rs10752269	A	G	-0.0129	0.5061	1.30E-09	0.0021	A	G	0.0308	0.6467	1.68E-01	0.0223	10	12692902	8.24E-05	36.878	8.24E-05	447485	2.36E-05	80996	TRUE	2.69E-01
	rs2351187	A	G	0.0129	0.3189	1.60E-08	0.0023	A	G	-0.0009	0.3125	9.70E-01	0.023	10	86850616	7.14E-05	31.959	7.14E-05	447485	1.89E-08	80996	TRUE	2.95E-02
	rs10741694	C	T	0.0150	0.6279	7.90E-12	0.0022	C	T	-0.0213	0.7341	3.76E-01	0.024	11	16286183	1.05E-04	46.784	1.05E-04	447485	9.72E-06	80996	TRUE	6.27E-02
	rs17245213	A	G	-0.0146	0.2080	2.00E-08	0.0026	A	G	0.0151	0.1738	5.90E-01	0.028	11	1679769	7.04E-05	31.521	7.04E-05	447485	3.59E-06	80996	TRUE	8.88E-02
	rs977474	T	C	0.0218	0.8337	2.40E-14	0.0029	T	C	-0.0830	0.9169	2.83E-02	0.0378	12	11284772	1.30E-04	58.180	1.30E-04	447485	5.95E-05	80996	TRUE	3.34E-01
	rs17576658	A	G	-0.0135	0.2471	4.10E-08	0.0025	A	G	-0.0536	0.2316	3.78E-02	0.0258	13	100272019	6.73E-05	30.116	6.73E-05	447485	5.33E-05	80996	TRUE	8.13E-01
	rs2645929	G	A	-0.0150	0.8131	3.50E-08	0.0027	G	A	-0.0352	0.8498	2.35E-01	0.0296	13	56444529	6.80E-05	30.424	6.80E-05	447485	1.75E-05	80996	TRUE	2.87E-01
	rs6829	T	C	-0.0119	0.5962	3.70E-08	0.0022	T	C	-0.0014	0.6000	9.50E-01	0.0218	13	111531264	6.77E-05	30.282	6.77E-05	447485	5.09E-08	80996	TRUE	3.62E-02
	rs12591786	T	C	-0.0184	0.1588	3.70E-10	0.0029	T	C	-0.0192	0.1002	5.88E-01	0.0355	15	60902512	8.78E-05	39.274	8.78E-05	447485	3.61E-06	80996	TRUE	5.05E-02
	rs9302428	G	C	0.0122	0.6358	2.60E-08	0.0022	G	C	-0.0505	0.6366	2.25E-02	0.0221	16	24717600	6.92E-05	30.948	6.92E-05	447485	6.45E-05	80996	TRUE	9.40E-01
	rs2279844	A	G	-0.0120	0.3793	4.00E-08	0.0022	A	G	-0.0049	0.3651	8.25E-01	0.022	17	40819809	6.74E-05	30.151	6.74E-05	447485	6.12E-07	80996	TRUE	5.18E-02
	rs4808193	C	T	0.0151	0.3353	1.70E-11	0.0022	C	T	0.0358	0.2469	1.45E-01	0.0246	19	19410622	1.01E-04	45.240	1.01E-04	447485	2.61E-05	80996	TRUE	1.96E-01
	rs57631352	G	A	-0.0131	0.2969	1.70E-08	0.0023	G	A	-0.0289	0.3363	2.00E-01	0.0225	19	4338173	7.12E-05	31.868	7.12E-05	447485	2.04E-05	80996	TRUE	3.04E-01
	rs2273447	T	A	0.0175	0.2038	3.30E-11	0.0026	T	A	0.0428	0.1362	1.65E-01	0.0309	20	62900120	9.83E-05	43.990	9.83E-05	447485	2.37E-05	80996	TRUE	1.86E-01
	rs4817505	C	T	0.0151	0.3900	4.20E-12	0.0022	C	T	-0.0069	0.4324	7.52E-01	0.0217	21	34343828	1.07E-04	48.012	1.07E-04	447485	1.25E-06	80996	TRUE	1.55E-02
	rs132904	C	G	0.0166	0.7787	7.80E-11	0.0026	C	G	-0.0090	0.7601	7.19E-01	0.0249	22	41798896	9.45E-05	42.296	9.45E-05	447485	1.61E-06	80996	TRUE	2.69E-02
	rs9624470	A	G	0.0252	0.5801	1.30E-31	0.0022	A	G	0.0241	0.5488	2.59E-01	0.0214	22	24820268	3.06E-04	136.839	3.06E-04	447485	1.57E-05	80996	TRUE	3.96E-04
Green tea intake	rs12144868	C	T	3.0727	0.0151	5.70E-09	0.5275	C	T	-0.1003	0.0304	0.1063	0.0621	1	41591310	5.22E-04	33.935	5.22E-04	64949	3.22E-05	80996	TRUE	1.11E-03
	rs142811251	C	G	3.4598	0.0103	2.10E-08	0.6178	C	G	-0.0281	0.0261	0.6824	0.0686	2	22985272	4.83E-04	31.359	4.83E-04	64949	2.07E-06	80996	TRUE	9.69E-05
	rs144954030	C	T	4.8802	0.0057	2.80E-09	0.8211	C	T	-0.1589	0.0252	0.0189	0.0677	2	213836477	5.44E-04	35.326	5.44E-04	64949	6.80E-05	80996	TRUE	4.21E-03
	rs145313301	C	G	4.9937	0.0061	7.90E-10	0.8125	C	G	-0.4760	0.0018	0.0624	0.2555	2	79537576	5.81E-04	37.773	5.81E-04	64949	4.29E-05	80996	TRUE	8.52E-04
	rs115952340	A	G	3.0097	0.0133	4.50E-08	0.5503	A	G	0.0336	0.0033	0.8642	0.1962	3	40875392	4.60E-04	29.915	4.60E-04	64949	3.62E-07	80996	TRUE	7.49E-05
	rs78547201	G	C	3.2750	0.0116	1.40E-08	0.5777	G	C	0.0478	0.0367	0.4172	0.0589	5	61713522	4.95E-04	32.132	4.95E-04	64949	8.13E-06	80996	TRUE	2.32E-04
	rs116985617	T	C	3.8927	0.0085	7.80E-09	0.6744	T	C	-0.1207	0.0049	0.4331	0.154	6	133084903	5.13E-04	33.315	5.13E-04	64949	7.58E-06	80996	TRUE	1.59E-04
	rs79774709	T	C	5.1406	0.0058	1.70E-09	0.8538	T	C	-0.2298	0.0040	0.1861	0.1738	6	117931871	5.58E-04	36.250	5.58E-04	64949	2.16E-05	80996	TRUE	3.15E-04
	rs11976995	G	T	2.0194	0.0304	7.00E-09	0.3487	G	T	-0.0327	0.0299	0.6068	0.0634	7	157531582	5.16E-04	33.540	5.16E-04	64949	3.28E-06	80996	TRUE	7.19E-05
	rs189140232	A	G	3.5608	0.0100	1.30E-08	0.6257	A	G	-0.1912	0.0158	0.0321	0.0892	7	35517966	4.98E-04	32.391	4.98E-04	64949	5.67E-05	80996	TRUE	4.96E-03
	rs116035596	T	C	4.9036	0.0066	4.10E-11	0.7429	T	C	0.0589	0.0081	0.6312	0.1227	9	28832005	6.70E-04	43.568	6.70E-04	64949	2.85E-06	80996	TRUE	4.30E-06
	rs644205	A	G	0.8489	0.1965	1.80E-08	0.1508	A	G	0.0113	0.2279	0.6569	0.0254	10	89745814	4.88E-04	31.705	4.88E-04	64949	2.44E-06	80996	TRUE	9.71E-05
	rs79638269	T	C	2.6764	0.0163	1.50E-08	0.4729	T	C	0.0633	0.0205	0.4023	0.0756	10	14841242	4.93E-04	32.029	4.93E-04	64949	8.66E-06	80996	TRUE	2.55E-04
	rs183788045	T	G	3.5482	0.0087	4.70E-08	0.6498	T	G	0.3618	0.0036	0.0540	0.1878	11	64006281	4.59E-04	29.818	4.59E-04	64949	4.58E-05	80996	TRUE	5.39E-03
	rs117251267	C	T	3.5501	0.0116	9.10E-09	0.6178	C	T	0.1300	0.0127	0.1927	0.0998	13	95673607	5.08E-04	33.024	5.08E-04	64949	2.09E-05	80996	TRUE	6.45E-04
	rs142373582	C	T	3.2463	0.0142	9.60E-09	0.5658	C	T	-0.3626	0.0031	0.0735	0.2026	14	104757781	5.07E-04	32.923	5.07E-04	64949	3.95E-05	80996	TRUE	2.07E-03
	rs113898417	G	C	3.9789	0.0070	4.40E-08	0.7266	G	C	-0.2212	0.0025	0.283	0.206	16	21614895	4.61E-04	29.984	4.61E-04	64949	1.42E-05	80996	TRUE	7.72E-04

	rs62059726	A	G	2.8216	0.0152	3.50E-08	0.5118	A	G	-0.0274	0.0061	0.844	0.139	17	48715705	4.68E-04	30.392	4.68E-04	64949	4.80E-07	80996	TRUE	7.03E-05
	rs12958992	G	A	2.1609	0.0269	1.20E-08	0.3789	G	A	-0.1518	0.0291	0.0185	0.0644	18	71259772	5.01E-04	32.524	5.01E-04	64949	6.86E-05	80996	TRUE	7.46E-03
	rs117077082	G	A	1.9206	0.0318	2.00E-08	0.3422	G	A	0.0046	0.0460	0.9273	0.0503	20	42928868	4.85E-04	31.503	4.85E-04	64949	1.03E-07	80996	TRUE	3.79E-05
	rs113322644	A	C	3.2096	0.0117	7.40E-09	0.5551	A	C	-0.0704	0.0041	0.6638	0.162	21	33992170	5.15E-04	33.434	5.15E-04	64949	2.33E-06	80996	TRUE	5.89E-05
Fresh fruit intake	rs2790688	T	C	0.0114	0.1541	1.50E-11	0.0017	T	C	-0.0148	0.1833	0.5943	0.0279	1	153992909	1.02E-04	45.544	1.02E-04	446462	3.47E-06	80996	TRUE	3.10E-02
	rs559734	C	G	0.0078	0.7118	1.10E-08	0.0014	C	G	-0.0163	0.6188	0.4605	0.0221	1	97304868	7.30E-05	32.587	7.30E-05	446462	6.72E-06	80996	TRUE	1.19E-01
	rs7554485	C	T	-0.0080	0.6115	1.70E-10	0.0013	C	T	-0.0505	0.4884	0.0178	0.0213	1	65945906	9.14E-05	40.793	9.14E-05	446462	6.94E-05	80996	TRUE	7.48E-01
	rs11896330	A	G	-0.0084	0.6328	3.40E-11	0.0013	A	G	-0.0221	0.6948	0.3413	0.0232	2	60235568	9.84E-05	43.919	9.84E-05	446462	1.12E-05	80996	TRUE	8.53E-02
	rs17049185	T	G	0.0080	0.2679	7.30E-09	0.0014	T	G	-0.0233	0.2583	0.3394	0.0244	2	58072660	7.49E-05	33.444	7.49E-05	446462	1.13E-05	80996	TRUE	1.65E-01
	rs72974263	T	C	0.0074	0.3183	1.80E-08	0.0013	T	C	0.0467	0.3078	0.0424	0.023	2	225447371	7.10E-05	31.679	7.10E-05	446462	5.09E-05	80996	TRUE	7.36E-01
	rs13072255	C	A	0.0090	0.4940	2.10E-13	0.0012	C	A	0.0133	0.3890	0.5415	0.0217	3	21038260	1.21E-04	53.867	1.21E-04	446462	4.64E-06	80996	TRUE	2.08E-02
	rs12641371	T	C	0.0079	0.4331	1.40E-10	0.0012	T	C	0.0275	0.4199	0.2009	0.0215	4	59882235	9.22E-05	41.147	9.22E-05	446462	2.02E-05	80996	TRUE	1.81E-01
	rs10064431	C	T	-0.0076	0.5225	6.00E-10	0.0012	C	T	-0.0332	0.5104	0.1215	0.0215	5	92950673	8.58E-05	38.311	8.58E-05	446462	2.94E-05	80996	TRUE	3.15E-01
	rs149449	A	G	0.0073	0.4892	2.40E-09	0.0012	A	G	-0.0202	0.6205	0.3568	0.0219	5	95902093	7.99E-05	35.655	7.99E-05	446462	1.05E-05	80996	TRUE	1.36E-01
	rs2143081	A	G	0.0083	0.5398	1.30E-11	0.0012	A	G	0.0238	0.5847	0.2704	0.0216	6	50782834	1.03E-04	45.844	1.03E-04	446462	1.50E-05	80996	TRUE	1.01E-01
	rs586346	C	T	-0.0069	0.6354	4.50E-08	0.0013	C	T	-0.0023	0.6548	0.9223	0.0238	6	31875712	6.70E-05	29.900	6.70E-05	446462	1.15E-07	80996	TRUE	4.00E-02
	rs10249294	A	G	0.0196	0.3730	4.10E-54	0.0013	A	G	0.0270	0.3394	0.2324	0.0226	7	143723137	5.37E-04	239.939	5.37E-04	446462	1.76E-05	80996	TRUE	6.69E-07
	rs10271924	T	C	-0.0070	0.4926	2.00E-08	0.0013	T	C	-0.0090	0.4215	0.6805	0.0218	7	153495206	7.05E-05	31.481	7.05E-05	446462	2.10E-06	80996	TRUE	6.89E-02
	rs12536253	C	G	-0.0082	0.2490	8.30E-09	0.0014	C	G	-0.0108	0.1765	0.699	0.0279	7	127595077	7.44E-05	33.205	7.44E-05	446462	1.85E-06	80996	TRUE	5.72E-02
	rs329274	G	A	0.0068	0.4856	2.80E-08	0.0012	G	A	0.0062	0.5161	0.7716	0.0214	7	35078743	6.90E-05	30.822	6.90E-05	446462	1.04E-06	80996	TRUE	5.63E-02
	rs1866823	A	G	0.0074	0.5445	2.10E-09	0.0012	A	G	0.0113	0.6289	0.6099	0.0221	8	57436577	8.04E-05	35.876	8.04E-05	446462	3.23E-06	80996	TRUE	6.06E-02
	rs7818437	C	T	-0.0080	0.2359	3.00E-08	0.0015	C	T	0.0391	0.2279	0.1803	0.0292	8	10209623	6.88E-05	30.701	6.88E-05	446462	2.21E-05	80996	TRUE	3.48E-01
	rs2093654	G	A	0.0071	0.3881	1.50E-08	0.0013	G	A	-0.0415	0.4585	0.0522	0.0214	9	5780121	7.18E-05	32.078	7.18E-05	446462	4.64E-05	80996	TRUE	6.63E-01
	rs4302893	A	G	0.0074	0.3342	1.30E-08	0.0013	A	G	-0.0027	0.3934	0.9030	0.0218	9	1734863	7.24E-05	32.323	7.24E-05	446462	1.89E-07	80996	TRUE	3.45E-02
	rs6475724	T	C	0.0077	0.7273	1.90E-08	0.0014	T	C	-0.0070	0.7203	0.7683	0.0238	9	23274223	7.07E-05	31.579	7.07E-05	446462	1.07E-06	80996	TRUE	5.34E-02
	rs7869969	G	A	0.0076	0.3308	5.70E-09	0.0013	G	A	-0.0361	0.3606	0.1026	0.0221	9	96217447	7.60E-05	33.927	7.60E-05	446462	3.29E-05	80996	TRUE	4.36E-01
	rs11248509	T	A	0.0073	0.3712	7.40E-09	0.0013	T	A	-0.0130	0.3943	0.5543	0.022	10	125134393	7.48E-05	33.414	7.48E-05	446462	4.31E-06	80996	TRUE	8.52E-02
	rs12780952	A	G	0.0075	0.2864	3.40E-08	0.0014	A	G	0.0377	0.2949	0.1053	0.0233	10	107577033	6.83E-05	30.492	6.83E-05	446462	3.23E-05	80996	TRUE	5.00E-01
	rs10840126	G	A	-0.0077	0.3761	1.90E-09	0.0013	G	A	0.0112	0.3760	0.6130	0.0222	11	8825774	8.07E-05	36.028	8.07E-05	446462	3.14E-06	80996	TRUE	5.90E-02
	rs11032362	A	G	0.0124	0.0910	5.30E-09	0.0021	A	G	0.0653	0.0559	0.1515	0.0456	11	33759092	7.63E-05	34.063	7.63E-05	446462	2.53E-05	80996	TRUE	3.32E-01
	rs60452247	A	G	0.0080	0.3631	3.40E-10	0.0013	A	G	0.0105	0.3079	0.6471	0.023	11	63981507	8.83E-05	39.422	8.83E-05	446462	2.57E-06	80996	TRUE	4.13E-02
	rs7982441	C	T	-0.0084	0.7319	9.80E-10	0.0014	C	T	0.0018	0.7652	0.9410	0.025	13	55924013	8.37E-05	37.371	8.37E-05	446462	6.40E-08	80996	TRUE	1.98E-02
	rs9517948	T	C	0.0070	0.4514	1.70E-08	0.0012	T	C	0.0036	0.3972	0.8678	0.0216	13	100650708	7.12E-05	31.807	7.12E-05	446462	3.43E-07	80996	TRUE	3.97E-02
	rs12885598	A	G	0.0075	0.5967	1.70E-09	0.0012	A	G	-0.0058	0.5373	0.7851	0.0214	14	32123347	8.13E-05	36.301	8.13E-05	446462	9.07E-07	80996	TRUE	3.47E-02
	rs1051547	C	T	-0.0076	0.5615	1.10E-09	0.0012	C	T	0.0030	0.6003	0.8913	0.0216	16	19279380	8.34E-05	37.224	8.34E-05	446462	2.38E-07	80996	TRUE	2.36E-02
	rs62051554	A	G	0.0116	0.1085	4.60E-09	0.0020	A	G	0.0532	0.1034	0.1284	0.035	16	72826387	7.69E-05	34.343	7.69E-05	446462	2.85E-05	80996	TRUE	3.69E-01
	rs139042899	C	A	0.0360	0.0135	3.20E-09	0.0061	C	A	-0.0130	0.0175	0.8741	0.0817	17	58443095	7.85E-05	35.037	7.85E-05	446462	3.13E-07	80996	TRUE	2.98E-02
	rs8095324	G	A	-0.0069	0.4040	2.70E-08	0.0012	G	A	0.0060	0.3396	0.7887	0.0224	18	24131659	6.93E-05	30.927	6.93E-05	446462	8.86E-07	80996	TRUE	5.33E-02
	rs11085749	A	G	-0.0077	0.3871	7.10E-10	0.0013	A	G	-0.0161	0.3851	0.4614	0.0218	19	10961273	8.51E-05	37.987	8.51E-05	446462	6.73E-06	80996	TRUE	8.26E-02
	rs739320	C	T	-0.0090	0.6058	1.90E-12	0.0013	C	T	0.0565	0.6740	0.0136	0.0229	19	49261368	1.11E-04	49.635	1.11E-04	446462	7.52E-05	80996	TRUE	6.24E-01

	rs78537042	A	C	-0.0119	0.0868	4.80E-08	0.0022	A	C	-0.0011	0.0299	0.9858	0.0628	21	33068937	6.68E-05	29.809	6.68E-05	446462	3.79E-09	80996	TRUE	3.37E-02
Cereal intake	rs10857964	C	T	0.0141	0.2051	1.70E-10	0.0022	C	T	-0.0066	0.3135	0.7729	0.023	1	113097633	9.24E-05	40.801	9.24E-05	441640	1.02E-06	80996	TRUE	2.44E-02
	rs12354267	C	T	0.0116	0.3091	1.70E-09	0.0019	C	T	0.0221	0.3435	0.3268	0.0225	1	44248272	8.22E-05	36.314	8.22E-05	441640	1.19E-05	80996	TRUE	1.42E-01
	rs184643	A	G	-0.0122	0.5667	1.60E-11	0.0018	A	G	-0.0036	0.6451	0.8729	0.0224	2	45189441	1.03E-04	45.437	1.03E-04	441640	3.19E-07	80996	TRUE	1.22E-02
	rs6545770	T	A	-0.0137	0.7481	2.70E-11	0.0021	T	A	0.0002	0.8669	0.9937	0.0311	2	60204427	1.01E-04	44.392	1.01E-04	441640	5.11E-10	80996	TRUE	8.87E-03
	rs9846396	T	C	0.0120	0.4416	3.00E-11	0.0018	T	C	0.0182	0.4520	0.3946	0.0214	3	141140968	1.00E-04	44.188	1.00E-04	441640	8.93E-06	80996	TRUE	6.65E-02
	rs11097340	T	C	-0.0115	0.3996	2.10E-10	0.0018	T	C	-0.0246	0.3772	0.2611	0.0219	4	93465297	9.14E-05	40.379	9.14E-05	441640	1.56E-05	80996	TRUE	1.42E-01
	rs3115230	A	C	-0.0115	0.7520	3.00E-08	0.0021	A	C	-0.0412	0.7031	0.0793	0.0235	4	123009766	6.95E-05	30.707	6.95E-05	441640	3.79E-05	80996	TRUE	5.69E-01
	rs10057775	C	T	0.0200	0.8936	4.50E-12	0.0029	C	T	-0.0482	0.8497	0.1076	0.0299	5	87469663	1.08E-04	47.907	1.08E-04	441640	3.21E-05	80996	TRUE	2.14E-01
	rs79642906	A	G	-0.0182	0.0833	1.90E-08	0.0032	A	G	-0.0134	0.0554	0.7759	0.0472	5	59650336	7.16E-05	31.640	7.16E-05	441640	9.95E-07	80996	TRUE	5.08E-02
	rs1853931	A	G	-0.0113	0.5313	3.80E-10	0.0018	A	G	-0.0309	0.5280	0.1489	0.0214	6	125170409	8.88E-05	39.223	8.88E-05	441640	2.57E-05	80996	TRUE	2.55E-01
	rs2817377	A	G	0.0099	0.5379	3.10E-08	0.0018	A	G	0.0246	0.5853	0.2558	0.0216	6	50789176	6.93E-05	30.617	6.93E-05	441640	1.60E-05	80996	TRUE	2.58E-01
	rs6918737	A	T	0.0137	0.2345	7.60E-11	0.0021	A	T	0.0203	0.2508	0.4082	0.0245	6	19721681	9.59E-05	42.367	9.59E-05	441640	8.48E-06	80996	TRUE	7.18E-02
	rs13234131	G	A	0.0170	0.1284	1.60E-10	0.0027	G	A	-0.0292	0.1274	0.3568	0.0317	7	73025975	9.26E-05	40.894	9.26E-05	441640	1.05E-05	80996	TRUE	9.48E-02
	rs2927238	G	T	0.0102	0.6132	2.10E-08	0.0018	G	T	-0.0197	0.5670	0.3587	0.0215	8	76758514	7.11E-05	31.392	7.11E-05	441640	1.04E-05	80996	TRUE	1.73E-01
	rs4739095	A	G	-0.0129	0.7657	9.90E-10	0.0021	A	G	-0.0134	0.7409	0.5798	0.0242	8	64391730	8.46E-05	37.347	8.46E-05	441640	3.79E-06	80996	TRUE	5.79E-02
	rs9987289	G	A	0.0179	0.9088	7.80E-09	0.0031	G	A	0.0231	0.8568	0.4801	0.0326	8	9183358	7.55E-05	33.336	7.55E-05	441640	6.20E-06	80996	TRUE	1.05E-01
	rs7040561	A	T	-0.0163	0.8506	1.10E-10	0.0025	A	T	-0.0215	0.8912	0.5233	0.0338	9	128528978	9.44E-05	41.676	9.44E-05	441640	5.00E-06	80996	TRUE	5.04E-02
	rs11038810	G	A	0.0111	0.6441	2.30E-09	0.0019	G	A	-0.0326	0.6673	0.148	0.0225	11	46210773	8.09E-05	35.709	8.09E-05	441640	2.59E-05	80996	TRUE	3.07E-01
	rs2450126	G	A	-0.0149	0.1567	1.30E-09	0.0025	G	A	0.0235	0.2016	0.3784	0.0267	11	77916279	8.33E-05	36.794	8.33E-05	441640	9.56E-06	80996	TRUE	1.14E-01
	rs68136852	A	C	-0.0141	0.1524	1.20E-08	0.0025	A	C	-0.0122	0.1083	0.7204	0.0341	17	27382061	7.35E-05	32.466	7.35E-05	441640	1.58E-06	80996	TRUE	5.56E-02
	rs4797242	A	C	0.0114	0.2972	4.50E-09	0.0019	A	C	0.0307	0.3366	0.1727	0.0225	18	6407483	7.79E-05	34.404	7.79E-05	441640	2.30E-05	80996	TRUE	2.92E-01
	rs11670024	G	A	0.0160	0.1155	1.10E-08	0.0028	G	A	0.0175	0.1537	0.5513	0.0294	19	18818335	7.41E-05	32.712	7.41E-05	441640	4.37E-06	80996	TRUE	8.83E-02
	rs6510177	C	T	-0.0130	0.8056	1.20E-08	0.0023	C	T	-0.0131	0.8393	0.6539	0.0292	19	31211647	7.35E-05	32.475	7.35E-05	441640	2.48E-06	80996	TRUE	6.71E-02
	rs78854891	C	T	0.0221	0.0657	1.10E-09	0.0036	C	T	0.0439	0.0483	0.3816	0.0502	19	42752078	8.41E-05	37.140	8.41E-05	441640	9.44E-06	80996	TRUE	1.11E-01
Salad/raw	rs4083969	G	C	0.0171	0.0572	3.80E-08	0.0031	G	C	0.0426	0.0421	0.4338	0.0545	1	231866480	6.95E-05	30.248	6.95E-05	435435	7.54E-06	80996	TRUE	1.44E-01
vegetable intake	rs17460017	T	A	0.0112	0.1901	7.20E-10	0.0018	T	A	0.0063	0.1796	0.8191	0.0276	5	137717681	8.72E-05	37.972	8.72E-05	435435	6.43E-07	80996	TRUE	2.57E-02
	rs12203592	T	C	-0.0103	0.2193	1.30E-09	0.0017	T	C	-0.0449	0.0301	0.4745	0.0628	6	396321	8.47E-05	36.866	8.47E-05	435435	6.31E-06	80996	TRUE	8.05E-02
	rs3095337	C	G	-0.0126	0.2039	9.00E-13	0.0018	C	G	-0.0396	0.0925	0.3083	0.0388	6	30737591	1.17E-04	51.060	1.17E-04	435435	1.29E-05	80996	TRUE	5.84E-02
	rs3129962	A	G	-0.0133	0.1292	3.70E-10	0.0021	A	G	-0.0856	0.0681	0.1061	0.0529	6	32379383	9.02E-05	39.280	9.02E-05	435435	3.23E-05	80996	TRUE	3.19E-01
	rs75248709	T	C	-0.0197	0.0459	2.20E-08	0.0035	T	C	0.0192	0.0535	0.6871	0.0478	6	92348945	7.19E-05	31.292	7.19E-05	435435	1.99E-06	80996	TRUE	6.48E-02
	rs57221424	G	C	0.0089	0.3217	5.50E-09	0.0015	G	C	0.0200	0.3118	0.3883	0.0232	7	35215670	7.81E-05	34.004	7.81E-05	435435	9.18E-06	80996	TRUE	1.29E-01
	rs62461186	C	A	-0.0113	0.1798	1.00E-09	0.0019	C	A	-0.0397	0.1065	0.244	0.034	7	77730153	8.57E-05	37.303	8.57E-05	435435	1.68E-05	80996	TRUE	1.78E-01
	rs7821179	C	G	-0.0108	0.8466	4.40E-08	0.0020	C	G	0.0190	0.8455	0.5198	0.0295	8	83061099	6.88E-05	29.961	6.88E-05	435435	5.12E-06	80996	TRUE	1.15E-01
	rs10819082	A	G	-0.0092	0.6673	1.40E-09	0.0015	A	G	0.0107	0.7915	0.6794	0.0258	9	128645617	8.42E-05	36.671	8.42E-05	435435	2.12E-06	80996	TRUE	4.37E-02
	rs1890012	G	T	-0.0104	0.1947	8.10E-09	0.0018	G	T	-0.0008	0.2278	0.9734	0.0253	13	54934882	7.64E-05	33.254	7.64E-05	435435	1.23E-08	80996	TRUE	2.42E-02
	rs12908495	A	C	-0.0094	0.2425	2.00E-08	0.0017	A	C	-0.0192	0.1608	0.5071	0.029	15	97011280	7.24E-05	31.507	7.24E-05	435435	5.41E-06	80996	TRUE	1.06E-01
	rs4291983	A	C	-0.0084	0.5176	3.70E-09	0.0014	A	C	-0.0271	0.5029	0.2011	0.0212	18	38106410	7.98E-05	34.756	7.98E-05	435435	2.02E-05	80996	TRUE	2.46E-01
	rs8130508	A	G	0.0087	0.2897	3.00E-08	0.0016	A	G	-0.0186	0.3139	0.4171	0.023	21	19049865	7.05E-05	30.681	7.05E-05	435435	8.07E-06	80996	TRUE	1.47E-01
Coffee intake	rs4615895	A	G	0.0122	0.7409	4.20E-11	0.0018	A	G	0.0216	0.7721	0.3926	0.0252	1	96274668	1.01E-04	43.519	1.01E-04	428860	9.07E-06	80996	TRUE	6.53E-02

	rs12989746	T	G	0.0104	0.2499	2.80E-08	0.0019	T	G	-0.0519	0.2622	0.0314	0.0241	2	49368391	7.19E-05	30.821	7.19E-05	428860	5.73E-05	80996	TRUE 8.12E-01
	rs1527961	C	T	-0.0133	0.1349	1.70E-08	0.0024	C	T	0.0401	0.1275	0.2056	0.0317	2	62780440	7.42E-05	31.808	7.42E-05	428860	1.98E-05	80996	TRUE 2.77E-01
	rs780093	C	T	0.0133	0.6158	1.00E-15	0.0017	C	T	-0.0315	0.6453	0.1582	0.0223	2	27742603	1.50E-04	64.366	1.50E-04	428860	2.46E-05	80996	TRUE 5.72E-02
	rs2597805	T	C	0.0099	0.6825	2.00E-08	0.0018	T	C	-0.0255	0.6251	0.2509	0.0222	4	17424930	7.34E-05	31.488	7.34E-05	428860	1.63E-05	80996	TRUE 2.37E-01
	rs12514566	A	G	-0.0114	0.3371	2.40E-11	0.0017	A	G	0.0131	0.2416	0.5983	0.0249	5	7391462	1.04E-04	44.651	1.04E-04	428860	3.42E-06	80996	TRUE 2.92E-02
	rs2465037	A	C	-0.0106	0.3430	4.80E-10	0.0017	A	C	0.0177	0.2927	0.4483	0.0234	6	51179260	9.04E-05	38.772	9.04E-05	428860	7.06E-06	80996	TRUE 7.38E-02
	rs1057868	T	C	0.0200	0.2850	5.40E-29	0.0018	T	C	-0.0029	0.3946	0.8947	0.0218	7	75615006	2.91E-04	124.900	2.91E-04	428860	2.18E-07	80996	TRUE 1.48E-05
	rs34060476	G	A	0.0184	0.1339	7.50E-15	0.0024	G	A	-0.0310	0.1313	0.3215	0.0312	7	73037956	1.41E-04	60.450	1.41E-04	428860	1.22E-05	80996	TRUE 2.87E-02
	rs73075167	T	A	-0.0161	0.1292	5.00E-11	0.0024	T	A	0.0021	0.1139	0.9492	0.0336	7	17570479	1.01E-04	43.191	1.01E-04	428860	4.82E-08	80996	TRUE 1.04E-02
	rs7811609	T	C	0.0091	0.3747	4.00E-08	0.0017	T	C	0.0153	0.3826	0.4854	0.0219	7	32930597	7.03E-05	30.137	7.03E-05	428860	6.03E-06	80996	TRUE 1.22E-01
	rs442355	C	G	-0.0111	0.2544	1.90E-09	0.0019	C	G	0.0500	0.2701	0.0366	0.0239	8	109128653	8.42E-05	36.095	8.42E-05	428860	5.40E-05	80996	TRUE 6.34E-01
	rs6469262	C	T	-0.0092	0.5650	1.90E-08	0.0016	C	T	0.0497	0.5177	0.0194	0.0212	8	110443480	7.36E-05	31.576	7.36E-05	428860	6.79E-05	80996	TRUE 9.29E-01
	rs78267637	G	C	-0.0254	0.0381	3.90E-09	0.0043	G	C	0.0461	0.0600	0.3230	0.0466	8	33790200	8.09E-05	34.695	8.09E-05	428860	1.21E-05	80996	TRUE 1.50E-01
	rs117810762	A	G	0.0359	0.0179	6.20E-09	0.0062	A	G	-0.0924	0.0096	0.3860	0.1066	10	135315795	7.88E-05	33.775	7.88E-05	428860	9.28E-06	80996	TRUE 1.28E-01
	rs61928609	C	A	-0.0147	0.8353	1.30E-11	0.0022	C	A	-0.0827	0.9167	0.0287	0.0378	12	11316437	1.07E-04	45.853	1.07E-04	428860	5.91E-05	80996	TRUE 4.89E-01
	rs117968677	A	G	-0.0310	0.0242	1.90E-08	0.0055	A	G	-0.0865	0.0354	0.1356	0.0579	15	75174251	7.38E-05	31.645	7.38E-05	428860	2.76E-05	80996	TRUE 3.83E-01
	rs8056750	T	C	0.0105	0.3591	1.30E-09	0.0017	T	C	0.0119	0.4098	0.5872	0.0218	16	70927078	8.57E-05	36.776	8.57E-05	428860	3.68E-06	80996	TRUE 5.53E-02
	rs57918684	A	G	0.0129	0.1547	8.60E-09	0.0022	A	G	0.0292	0.2574	0.2351	0.0246	17	60150383	7.73E-05	33.141	7.73E-05	428860	1.74E-05	80996	TRUE 2.28E-01
	rs630194	C	T	-0.0114	0.3434	2.30E-11	0.0017	C	T	0.0138	0.3863	0.5287	0.022	18	40950954	1.04E-04	44.678	1.04E-04	428860	4.86E-06	80996	TRUE 3.67E-02
	rs75347775	A	G	0.0105	0.2445	2.70E-08	0.0019	A	G	-0.0302	0.2578	0.2158	0.0244	19	18495908	7.21E-05	30.933	7.21E-05	428860	1.89E-05	80996	TRUE 2.79E-01
	rs6062682	T	C	0.0104	0.4645	2.50E-10	0.0016	T	C	0.0181	0.3202	0.4246	0.0227	20	62891820	9.33E-05	40.020	9.33E-05	428860	7.85E-06	80996	TRUE 7.34E-02
	rs6063085	C	A	0.0104	0.3735	4.50E-10	0.0017	C	A	0.0025	0.3532	0.9098	0.0223	20	45840459	9.07E-05	38.899	9.07E-05	428860	1.55E-07	80996	TRUE 1.72E-02
	rs13054099	C	T	-0.0108	0.2610	4.30E-09	0.0018	C	T	-0.0101	0.2250	0.6912	0.0255	22	41215672	8.03E-05	34.460	8.03E-05	428860	1.94E-06	80996	TRUE 4.81E-02
	rs17842490	G	A	-0.0452	0.0142	3.30E-11	0.0068	G	A	0.0072	0.0072	0.9565	0.1327	22	24870527	1.03E-04	44.011	1.03E-04	428860	3.63E-08	80996	TRUE 9.48E-03
Dried fruit intake	rs11586016	C	G	0.0099	0.3710	1.10E-08	0.0017	C	G	0.0255	0.3827	0.2461	0.022	1	44031793	7.73E-05	32.590	7.73E-05	421764	1.66E-05	80996	TRUE 2.19E-01
	rs12137234	T	C	0.0102	0.3038	2.80E-08	0.0018	T	C	0.0324	0.2771	0.1731	0.0238	1	72270797	7.31E-05	30.847	7.31E-05	421764	2.29E-05	80996	TRUE 3.26E-01
	rs261809	G	A	-0.0096	0.5406	9.80E-09	0.0017	G	A	-0.0092	0.4718	0.6682	0.0214	1	241054465	7.80E-05	32.886	7.80E-05	421764	2.28E-06	80996	TRUE 5.64E-02
	rs72720396	G	A	0.0114	0.2292	8.70E-09	0.0020	G	A	-0.0412	0.1635	0.1513	0.0287	1	91191582	7.85E-05	33.123	7.85E-05	421764	2.54E-05	80996	TRUE 3.20E-01
	rs75641275	C	A	-0.0142	0.1434	2.90E-09	0.0024	C	A	-0.0329	0.2231	0.1963	0.0255	1	98327133	8.36E-05	35.250	8.36E-05	421764	2.06E-05	80996	TRUE 2.30E-01
	rs17184707	T	C	-0.0114	0.2128	2.10E-08	0.0020	T	C	-0.0348	0.2254	0.1719	0.0255	2	166183577	7.45E-05	31.434	7.45E-05	421764	2.30E-05	80996	TRUE 3.17E-01
	rs4149513	A	G	0.0117	0.4935	2.20E-12	0.0017	A	G	-0.0138	0.5082	0.5145	0.0212	2	101022726	1.17E-04	49.254	1.17E-04	421764	5.23E-06	80996	TRUE 2.64E-02
	rs7582086	T	G	-0.0096	0.4683	8.80E-09	0.0017	T	G	-0.0185	0.5810	0.3926	0.0217	2	60231826	7.84E-05	33.088	7.84E-05	421764	8.97E-06	80996	TRUE 1.27E-01
	rs7599488	T	C	-0.0104	0.4264	6.70E-10	0.0017	T	C	-0.0418	0.4791	0.0493	0.0213	2	60718347	9.03E-05	38.104	9.03E-05	421764	4.75E-05	80996	TRUE 4.96E-01
	rs11720884	G	A	0.0112	0.2501	7.60E-09	0.0019	G	A	0.0296	0.2819	0.2099	0.0236	3	43941406	7.91E-05	33.362	7.91E-05	421764	1.94E-05	80996	TRUE 2.42E-01
	rs4269101	G	T	-0.0138	0.7189	1.10E-13	0.0019	G	T	0.0477	0.6578	0.0345	0.0226	3	18763543	1.31E-04	55.172	1.31E-04	421764	5.50E-05	80996	TRUE 2.95E-01
	rs57499472	C	T	0.0099	0.4041	8.10E-09	0.0017	C	T	-0.0268	0.5063	0.2101	0.0214	3	147239337	7.89E-05	33.262	7.89E-05	421764	1.94E-05	80996	TRUE 2.43E-01
	rs10026792	A	G	0.0108	0.2904	3.90E-09	0.0018	A	G	-0.0012	0.3567	0.9569	0.0223	4	2862190	8.22E-05	34.662	8.22E-05	421764	3.58E-08	80996	TRUE 2.07E-02
	rs2328887	C	T	0.0189	0.8995	8.80E-12	0.0028	C	T	0.0221	0.9432	0.6333	0.0463	6	25430149	1.10E-04	46.588	1.10E-04	421764	2.81E-06	80996	TRUE 2.13E-02
	rs746868	G	C	-0.0129	0.6147	5.20E-14	0.0017	G	C	-0.0033	0.6496	0.8847	0.0226	6	31540429	1.34E-04	56.658	1.34E-04	421764	2.63E-07	80996	TRUE 3.88E-03
	rs7808471	C	T	-0.0115	0.3221	1.10E-10	0.0018	C	T	0.0023	0.3208	0.9201	0.0229	7	132716502	9.89E-05	41.720	9.89E-05	421764	1.25E-07	80996	TRUE 1.24E-02

rs893856	A	G	-0.0134	0.1490	1.30E-08	0.0023	A	G	0.0598	0.1848	0.0297	0.0275	10	126723567	7.67E-05	32.346	7.67E-05	421764	5.84E-05	80996	TRUE	7.71E-01
rs10896126	G	A	-0.0150	0.3036	1.60E-16	0.0018	G	A	-0.0115	0.2331	0.6461	0.025	11	66292908	1.61E-04	68.068	1.61E-04	421764	2.61E-06	80996	TRUE	3.85E-03
rs1622515	G	A	0.0099	0.4847	2.90E-09	0.0017	G	A	-0.0030	0.4650	0.8874	0.0212	11	95523433	8.35E-05	35.232	8.35E-05	421764	2.47E-07	80996	TRUE	2.43E-02
rs3764002	T	C	0.0131	0.2614	5.10E-12	0.0019	T	C	-0.0026	0.3434	0.9095	0.0224	12	108618630	1.13E-04	47.653	1.13E-04	421764	1.66E-07	80996	TRUE	7.71E-03
rs10129747	G	A	0.0094	0.5303	2.60E-08	0.0017	G	A	0.0087	0.4461	0.6832	0.0214	14	77433198	7.35E-05	30.988	7.35E-05	421764	2.04E-06	80996	TRUE	6.26E-02
rs4140799	A	G	0.0095	0.5319	1.80E-08	0.0017	A	G	0.0167	0.5431	0.4352	0.0214	14	72170969	7.53E-05	31.743	7.53E-05	421764	7.52E-06	80996	TRUE	1.22E-01
rs11632215	C	A	-0.0141	0.1202	4.40E-08	0.0026	C	A	0.0000	0.1256	0.9991	0.0321	15	45327794	7.10E-05	29.963	7.10E-05	421764	0	80996	TRUE	2.80E-02
rs1797235	C	G	-0.0100	0.3746	8.90E-09	0.0017	C	G	-0.0253	0.3454	0.2571	0.0223	15	47821612	7.84E-05	33.076	7.84E-05	421764	1.59E-05	80996	TRUE	2.04E-01
rs1582322	G	A	0.0099	0.6048	6.80E-09	0.0017	G	A	0.0150	0.6875	0.5143	0.023	16	52105988	7.96E-05	33.588	7.96E-05	421764	5.25E-06	80996	TRUE	8.38E-02
rs62084586	C	T	0.0134	0.1657	3.20E-09	0.0023	C	T	-0.0298	0.2042	0.2589	0.0264	17	56423201	8.32E-05	35.073	8.32E-05	421764	1.57E-05	80996	TRUE	1.79E-01
rs8081370	T	C	-0.0167	0.9102	1.40E-08	0.0029	T	C	-0.0112	0.8430	0.7019	0.0292	17	1373612	7.63E-05	32.181	7.63E-05	421764	1.82E-06	80996	TRUE	5.42E-02
rs11152349	A	G	0.0099	0.3029	4.90E-08	0.0018	A	G	0.0162	0.2969	0.4853	0.0233	18	60233646	7.05E-05	29.740	7.05E-05	421764	5.97E-06	80996	TRUE	1.21E-01

Abbreviations: EA, effect allele; EAF, effect allele frequency; OA, other allele; SE, standard error; SNPs, single nucleotide polymorphisms.

Supplementary Table 4 Characteristics of pleiotropic SNPs found in the Phenoscanner database

Exposure	SNPs	EA	OA	EAF	Beta	SE	*p*-value	Confounding factor
Alcohol intake frequency	rs473098	T	C	0.5577	-0.0217	0.0030	9.10E-13	Ever smoked
	rs9814516	T	G	0.2374	-0.0251	0.0036	1.60E-12	Ever smoked
	rs1228589	A	G	0.2461	0.0211	0.0035	2.30E-09	Body mass index
	rs13135092	G	A	0.0835	0.0438	0.0055	1.60E-15	Body mass index
	rs2160935	T	C	0.6043	-0.0187	0.0031	1.40E-09	Body mass index
	rs34811474	A	G	0.2307	-0.0202	0.0036	1.90E-08	Body mass index
	rs362307	T	C	0.0746	0.0433	0.0058	8.40E-14	Body mass index
	rs9372625	A	G	0.3817	-0.0256	0.0031	2.90E-16	Body mass index
	rs11039429	T	C	0.4546	-0.0236	0.0030	8.70E-15	Body mass index
	rs2411453	G	T	0.5974	-0.0351	0.0031	7.30E-30	Body mass index
	rs35105141	T	C	0.4015	0.0263	0.0031	1.40E-17	Body mass index
	rs489062	A	G	0.4375	0.0166	0.0031	4.90E-08	Body mass index
	rs61873510	T	G	0.3279	0.0204	0.0033	6.9E-10	Body mass index
	rs7302200	A	G	0.3400	-0.0184	0.0032	8.4E-09	Body mass index
	rs4940926	C	T	0.7350	-0.0191	0.0034	2.80E-08	Body mass index
	rs73050128	A	C	0.1645	-0.0260	0.0041	2.10E-10	Body mass index
Average weekly red wine intake	rs10822129	T	C	0.4065	0.0134	0.0021	2.70E-10	Body mass index
	rs12692596	T	C	0.3706	-0.0117	0.0021	4.50E-08	Body mass index
	rs1446577	G	C	0.2564	0.0151	0.0024	1.50E-10	Body mass index
	rs17817497	C	T	0.3925	0.0141	0.0021	2.60E-11	Body mass index
	rs303753	A	G	0.3447	-0.0183	0.0022	6.00E-17	Body mass index
	rs6882046	G	A	0.2689	0.0163	0.0023	4.10E-12	Body mass index
	rs9388171	G	C	0.5223	0.0146	0.0021	1.80E-12	Body mass index
Average weekly champagne plus white wine intake	rs35121390	G	C	0.4001	0.0124	0.0021	6.50E-09	Body mass index
Average weekly spirits intake	rs62033406	A	A	0.4088	0.0145	0.0022	7.80E-11	Body mass index
Average weekly beer plus cider intake	rs10822159	T	C	0.4179	-0.0119	0.0017	6.40E-12	Body mass index
	rs2883059	C	T	0.4251	0.0117	0.0017	1.30E-11	Body mass index
	rs9824301	C	A	0.3512	-0.0103	0.0018	1.00E-08	Past tobacco smoking
	rs9969466	C	G	0.5665	0.0103	0.0017	2.50E-09	Body mass index
Processed meat intake	rs1422192	A	G	0.1581	0.0170	0.0029	3.40E-09	Body mass index
	rs4240672	A	G	0.4940	0.0171	0.0021	3.00E-16	Body mass index
	rs7531118	C	T	0.5311	-0.0141	0.0021	2.80E-11	Body mass index

	rs77165542	T	C	0.0355	0.0339	0.0057	3.30E-09	Body mass index
Poultry intake	rs1051730	A	G	0.3314	-0.0109	0.0019	1.70E-08	Smoking
	rs7046351	A	T	0.5097	0.0111	0.0018	1.10E-09	Body mass index
	rs9997448	T	C	0.3692	-0.0105	0.0019	2.70E-08	Body mass index
Beef intake	rs10789340	G	A	0.6267	-0.0138	0.0018	6.80E-15	Body mass index
	rs12247907	C	G	0.4858	0.0098	0.0017	8.90E-09	Body mass index
	rs62396185	C	G	0.2601	-0.0148	0.0020	2.80E-14	Body mass index
	rs9407624	A	T	0.4882	-0.0138	0.0017	1.10E-15	Body mass index
Non-oily fish intake	rs56094641	G	A	0.4046	0.0126	0.0017	2.50E-14	Body mass index
Oily fish intake	rs10510554	C	T	0.5693	0.0110	0.0019	1.20E-08	Body mass index
	rs10513136	A	G	0.0654	-0.0233	0.0039	1.60E-09	Body mass index
	rs10828250	G	C	0.3093	-0.0201	0.0021	2.60E-22	Body mass index
	rs11986122	G	C	0.4226	0.0148	0.0019	2.90E-14	Body mass index
	rs13070166	A	T	0.2286	0.0142	0.0023	4.40E-10	Ever smoked
	rs790564	C	A	0.7230	0.0147	0.0021	7.90E-12	Body mass index
	rs9886779	A	T	0.4392	-0.0107	0.0019	2.70E-08	Body mass index
	rs12855717	T	C	0.5268	-0.0122	0.0019	2.00E-10	Ever smoked
	rs12983532	T	C	0.2511	-0.0134	0.0022	2.00E-09	Body mass index
	rs1951286	G	T	0.6449	-0.0146	0.0020	3.00E-13	Body mass index
	rs510161	G	C	0.3104	-0.0113	0.0021	4.50E-08	Body mass index
	rs9958909	G	T	0.1397	0.0158	0.0028	1.40E-08	Body mass index
Pork intake	rs12721051	G	C	0.1884	-0.0124	4.54E+07	5.60E-11	Body mass index
	rs1355171	A	C	0.4888	-0.0110	1.57E+07	1.00E-13	Body mass index
Lamb/mutton intake	rs2726033	A	G	0.4224	-0.0095	0.0015	1.50E-10	Body mass index
	rs276453	C	A	0.4884	-0.0142	0.0015	2.90E-22	Body mass index
	rs62106258	C	T	0.0486	0.0216	0.0034	2.00E-10	Body mass index
	rs7550173	T	A	0.6103	0.0216	0.0034	2.00E-10	Body mass index
Bread intake	rs1994315	C	T	0.6852	-0.0168	0.0021	4.30E-15	Body mass index
	rs11060853	G	A	0.4118	-0.0128	0.0020	2.50E-10	Body mass index
	rs6754311	C	T	0.2645	-0.0128	0.0020	2.50E-10	Body mass index
Cheese intake	rs10938397	G	A	0.4345	-0.0127	0.0023	1.80E-08	Body mass index
	rs13107325	T	C	0.0747	-0.0292	0.0043	7.00E-12	Body mass index
	rs2352974	T	C	0.4898	-0.0145	0.0022	1.00E-10	Body mass index
	rs504675	T	C	0.3526	0.0274	0.0023	1.00E-31	Ever smoked

	rs10896050	T	G	0.1932	-0.0185	0.0028	7.20E-11	Body mass index
	rs11649653	G	C	0.3821	0.0138	0.0023	1.50E-09	Body mass index
	rs2960578	G	T	0.4963	0.0170	0.0022	2.60E-14	Body mass index
	rs4503172	T	C	0.6083	0.0130	0.0023	1.60E-08	Body mass index
	rs6126641	A	G	0.3362	0.0132	0.0024	3.30E-08	Body mass index
	rs62034322	A	G	0.3798	-0.0139	0.0023	1.40E-09	Body mass index
	rs7012814	A	G	0.4740	-0.0185	0.0023	2.10E-16	Body mass index
	rs4776970	T	A	0.3580	0.0154	0.0023	3.50E-11	Body mass index
Cooked vegetable intake	rs12550717	A	G	0.3724	0.0092	0.0016	1.40E-08	Body mass index
	rs28711392	C	T	0.3671	-0.0107	0.0016	4.60E-11	Body mass index
	rs349062	C	G	0.3928	-0.0089	0.0016	2.50E-08	Body mass index
	rs4851029	G	T	0.5270	0.0102	0.0016	7.80E-11	Ever smoked
Tea intake	rs1453548	A	T	0.6649	-0.0133	0.0022	3.00E-09	Ever smoked
	rs9937354	A	G	0.4241	-0.0141	0.0021	4.90E-11	Body mass index
Fresh fruit intake	rs10192394	T	C	0.5288	-0.0077	0.0012	4.50E-10	Ever smoked
	rs1356292	T	C	0.8075	0.0092	0.0016	3.50E-09	Body mass index
	rs1375566	A	G	0.6274	-0.0078	0.0013	6.10E-10	Ever smoked
	rs1620977	G	A	0.7305	-0.0132	0.0014	1.10E-21	Body mass index
	rs2867113	A	G	0.1309	-0.0139	0.0020	1.50E-12	Body mass index
	rs817223	C	T	0.4813	-0.0073	0.0012	2.80E-09	Ever smoked
	rs10828266	G	A	0.7156	0.0124	0.0014	8.10E-20	Body mass index
	rs10838724	T	G	0.3680	0.0090	0.0013	2.10E-12	Body mass index
	rs28479795	T	C	0.2215	0.0112	0.0015	2.50E-14	Body mass index
	rs73455661	G	A	0.2793	0.0103	0.0014	4.10E-14	Body mass index
	rs9919429	G	A	0.4860	-0.0067	0.0012	3.80E-08	Body mass index
Cereal intake	rs2504706	C	T	0.2347	0.0182	0.0021	5.30E-18	Body mass index
	rs2799849	T	C	0.6781	-0.0123	0.0019	9.80E-11	Past tobacco smoking
	rs491711	C	A	0.3120	0.0117	0.0019	1.50E-09	Body mass index
	rs4988235	A	G	0.7369	0.0114	0.0020	1.50E-08	Body mass index
	rs56131196	A	G	0.1887	0.0180	0.0023	2.70E-15	Body mass index
	rs62442924	T	C	0.1943	0.0127	0.0023	1.70E-08	Body mass index
	rs67723420	A	T	0.3763	0.0105	0.0018	1.20E-08	Body mass index
	rs8097544	G	A	0.1452	-0.0246	0.0025	3.20E-22	Body mass index
	rs9374896	T	C	0.4663	0.0175	0.0018	1.30E-22	Body mass index

Salad/raw vegetable intake	rs1052352	T	C	0.5236	0.0082	0.0014	1.00E-08	Body mass index
	rs6482190	G	A	0.7194	0.0113	0.0016	1.40E-12	Body mass index
	rs790561	G	A	0.7041	0.0125	0.0016	1.40E-15	Body mass index
Coffee intake	rs516636	A	C	0.2089	0.0117	0.0020	4.00E-09	Body mass index
	rs13387939	A	C	0.8284	0.0166	0.0021	9.80E-15	Body mass index
	rs13163336	A	C	0.1576	0.0149	0.0022	1.30E-11	Body mass index
	rs1338549	G	T	0.5339	-0.0095	0.0016	5.60E-09	Body mass index
	rs9398171	T	C	0.7106	0.0109	0.0018	1.10E-09	Body mass index
	rs476828	C	T	0.2374	0.0173	0.0019	5.60E-20	Body mass index
	rs56113850	C	T	0.5781	0.0127	0.0016	8.90E-15	Smoking status: previous
Dried fruit intake	rs10740991	C	G	0.7176	0.0167	0.0019	1.99986E-19	Body mass index
	rs11037497	C	G	0.4462	0.0104	0.0017	5.69994E-10	Body mass index
	rs11772627	C	G	0.1820	0.0183	0.0022	2.99985E-17	Body mass index
	rs17175518	A	C	0.2328	0.0115	0.0020	5.89997E-09	Body mass index
	rs3101339	C	A	0.6033	0.0143	0.0017	6.20012E-17	Body mass index
	rs7916868	T	A	0.5035	0.0096	0.0017	9.09997E-09	Body mass index
	rs9385269	T	C	0.5246	0.0121	0.0017	7.19946E-13	Body mass index
	rs4800488	A	C	0.4899	0.0120	0.0017	7.70016E-13	Body mass index

Abbreviations: EA, effect allele; EAF, effect allele frequency; OA, other allele; SE, standard error; SNPs, single nucleotide polymorphisms.

Supplementary Table 5 Characteristics of pleiotropic SNPs associated with multiple dietary factors

SNPs	Exposure
rs11940694	Alcohol intake frequency, Cereal intake
rs1229984	Alcohol intake frequency, Average weekly red wine intake, Average weekly beer plus cider intake
rs1421085	Alcohol intake frequency, Average weekly beer plus cider intake, Beef intake, Oily fish intake, Cooked vegetable intake, Coffee intake
rs1104608	Alcohol intake frequency, Cereal intake
rs713598	Average weekly red wine intake, Tea intake
rs838133	Processed meat intake, Non-oily fish intake, Pork intake, Cooked vegetable intake,Cereal intake
rs4953150	Average weekly beer plus cider intake, Fresh fruit intake
rs2533273	Average weekly beer plus cider intake, Dried fruit intake
rs7829800	Poultry intake, Dried fruit intake
rs429358	Beef intake, Lamb/mutton intake, Dried fruit intake
rs35287743	Non-oily fish intake, Oily fish intake
rs3964074	Pork intake, Lamb/mutton intake
rs994270	Lamb/mutton intake, Fresh fruit intake
rs4410790	Tea intake, Cereal intake, Coffee intake
rs2472297	Tea intake, Cereal intake, Coffee intake
rs34162196	Fresh fruit intake, Dried fruit intake
rs862227	Fresh fruit intake, Dried fruit intake
rs7619139	Cereal intake, Salad/raw vegetable intake

Abbreviations: SNPs, single nucleotide polymorphisms.

Supplementary Table 6 Removing the following SNPs for incompatible alleles and palindromics with intermediate allele frequencies

Exposure	Outcome	Incompatible alleles	Palindromic with intermediate allele frequencies
Alcohol intake frequency	Prostate cancer	rs1893659, rs9958320	rs1894544, rs62097995, rs1104608
Average weekly beer plus cider intake	Prostate cancer	NA	rs60063924
Beef intake	Prostate cancer	NA	rs11165829
Oily fish intake	Prostate cancer	rs34555420	NA
Lamb/mutton intake	Prostate cancer	NA	rs2140714
Bread intake	Prostate cancer	NA	rs1492988, rs7276867, rs9832088
Cheese intake	Prostate cancer	NA	rs1024853
Tea intake	Prostate cancer	NA	rs2783129
Fresh fruit intake	Prostate cancer	NA	rs2048522, rs2302593
Cereal intake	Prostate cancer	NA	rs10837531, rs3859193, rs627185
Salad/raw vegetable intake	Prostate cancer	rs3129962	rs13102393, rs2194027, rs9427220
Coffee intake	Prostate cancer	NA	rs10119174, rs7224815

Supplementary Table 7 Removing the SNPs with "FALSE" MR Steiger filtering test results

Exposure	Outcome	SNPs	rsq.exposure	effective_n.exposure	rsq.outcome	effective_n.outcome	steiger_direction	steiger_pval
Alcohol intake frequency	Prostate cancer	rs838145	1.12E-04	462346	1.35E-04	80996	FALSE	0.778
		rs74679146	6.7115E-05	462346	8.57E-05	80996	FALSE	0.779
Beef intake	Prostate cancer	rs7791463	6.75735E-05	461053	2.82E-04	80996	FALSE	0.024
Oily fish intake	Prostate cancer	rs75887709	6.94E-05	460443	7.46E-05	80996	FALSE	0.936
Cheese intake	Prostate cancer	rs12447542	7.44E-05	451486	8.32E-05	80996	FALSE	0.897
Cooked vegetable intake	Prostate cancer	rs2252508	7.57E-05	448651	1.39E-04	80996	FALSE	0.415
Tea intake	Prostate cancer	rs10764990	7.06E-05	447485	7.60E-05	80996	FALSE	0.934
Fresh fruit intake	Prostate cancer	rs12044599	8.80E-05	446462	1.19E-04	80996	FALSE	0.685
Cereal intake	Prostate cancer	rs112780312	8.19784E-05	441640	2.78E-04	80996	FALSE	0.046
Salad/raw vegetable intake	Prostate cancer	rs34186148	6.84E-05	435435	1.01E-04	80996	FALSE	0.644
Coffee intake	Prostate cancer	rs1942965	7.05E-05	428860	1.27E-04	80996	FALSE	0.451
		rs2189234	8.43E-05	428860	8.74E-05	80996	FALSE	0.966
		rs62064918	7.02E-05	428860	1.65E-04	80996	FALSE	0.243
Dried fruit intake	Prostate cancer	rs11811826	1.03E-04	421764	1.24E-04	80996	FALSE	0.793
		rs1648404	7.50E-05	421764	7.53E-05	80996	FALSE	0.997

Abbreviations: SNPs, single nucleotide polymorphisms.

Supplementary Table 8 MR analysis for the causal effects of the 22 dietary factors on PCa

Exposure	Outcome	Number of SNPs	Method	Beta	SE	Lower 90% CI	Upper 90% CI	OR	Lower 95% CI	Upper 95% CI	*p*-value
Alcohol intake frequency	Prostate cancer	72	IVW_MRE	0.094	0.145	-0.190	0.377	1.098	0.827	1.459	0.517
		72	IVW_FE	0.094	0.130	-0.161	0.348	1.098	0.852	1.417	0.470
		72	MR-Egger	-0.040	0.548	-1.113	1.033	0.961	0.328	2.810	0.942
		72	Weighted median	0.264	0.204	-0.136	0.664	1.303	0.873	1.943	0.195
		72	Simple mode	-0.017	0.494	-0.985	0.952	0.984	0.373	2.590	0.973
		72	Weighted mode	0.284	0.370	-0.441	1.009	1.328	0.643	2.743	0.446
		72	MR-RAPS	0.161	0.137	-0.108	0.430	1.175	0.898	1.537	0.241
Average weekly red wine intake	Prostate cancer	10	IVW_MRE	0.982	0.750	-0.487	2.451	2.671	0.615	11.605	0.190
		10	IVW_FE	0.982	0.588	-0.169	2.134	2.671	0.844	8.448	0.095
		10	MR-Egger	-3.425	5.082	-13.385	6.535	0.033	0.000	688.856	0.519
		10	Weighted median	1.070	0.852	-0.599	2.740	2.916	0.549	15.484	0.209
		10	Simple mode	0.829	1.288	-1.694	3.353	2.291	0.184	28.585	0.536
		10	Weighted mode	0.933	1.229	-1.476	3.342	2.542	0.228	28.271	0.467
		10	MR-RAPS	1.460	0.627	0.231	2.689	4.306	1.260	14.716	0.020
Average weekly champagne plus white wine intake	Prostate cancer	3	IVW_MRE	0.040	1.549	-2.996	3.077	1.041	0.050	21.683	0.979
		3	IVW_FE	0.040	1.067	-2.050	2.131	1.041	0.129	8.420	0.970
		3	MR-Egger	50.187	25.580	0.050	100.325	6.25E+21	1.051	3.72E+43	0.300
		3	Weighted median	-1.270	1.460	-4.131	1.591	0.281	0.016	4.911	0.384
		3	Simple mode	-1.294	1.635	-4.498	1.910	0.274	0.011	6.751	0.512
		3	Weighted mode	-1.294	1.510	-4.253	1.665	0.274	0.014	5.285	0.482
		3	MR-RAPS	-0.263	1.140	-2.497	1.971	0.769	0.082	7.181	0.817
Average weekly spirits intake	Prostate cancer	3	IVW_MRE	-1.160	2.054	-5.187	2.866	0.313	0.006	17.573	0.572
		3	IVW_FE	-1.160	1.009	-3.138	0.817	0.313	0.043	2.265	0.250
		3	MR-Egger	7.049	7.960	-8.553	22.651	1151.857	1.93E-04	6.87E+09	0.539
		3	Weighted median	-0.636	1.496	-3.569	2.297	0.530	0.028	9.945	0.671
		3	Simple mode	-0.770	2.284	-5.246	3.705	0.463	0.005	40.670	0.768
		3	Weighted mode	0.038	1.850	-3.589	3.665	1.039	0.028	39.052	0.985
		3	MR-RAPS	-1.150	1.110	-3.326	1.026	0.317	0.036	2.789	0.300
Average weekly beer plus cider intake	Prostate cancer	12	IVW_MRE	1.196	0.637	-0.052	2.443	3.305	0.949	11.510	0.060
		12	IVW_FE	1.196	0.581	0.057	2.334	3.305	1.059	10.320	0.040
		12	MR-Egger	4.537	2.900	-1.147	10.220	93.363	0.318	27433.495	0.149
		12	Weighted median	1.756	0.835	0.120	3.392	5.790	1.128	29.729	0.035
		12	Simple mode	2.010	1.416	-0.765	4.785	7.463	0.465	119.732	0.184

		12	Weighted mode	2.010	1.639	-1.202	5.222	7.463	0.301	185.295	0.246
		12	MR-RAPS	1.420	0.616	0.213	2.627	4.137	1.237	13.837	0.022
Processed meat intake	Prostate cancer	18	IVW_MRE	-0.631	0.367	-1.351	0.089	0.532	0.259	1.093	0.086
		18	IVW_FE	-0.631	0.397	-1.409	0.147	0.532	0.245	1.158	0.112
		18	MR-Egger	0.012	2.174	-4.249	4.273	1.012	0.014	71.718	0.996
		18	Weighted median	-0.455	0.560	-1.552	0.641	0.634	0.212	1.899	0.416
		18	Simple mode	0.239	1.062	-1.843	2.321	1.270	0.158	10.184	0.825
		18	Weighted mode	0.179	0.983	-1.747	2.105	1.196	0.174	8.209	0.858
		18	MR-RAPS	-0.649	0.419	-1.470	0.172	0.523	0.230	1.188	0.121
Poultry intake	Prostate cancer	4	IVW_MRE	0.395	1.086	-1.733	2.523	1.484	0.177	12.461	0.716
		4	IVW_FE	0.395	1.068	-1.698	2.487	1.484	0.183	12.026	0.712
		4	MR-Egger	2.776	45.684	-86.764	92.316	16.055	2.08E-38	1.24E+40	0.957
		4	Weighted median	0.668	1.355	-1.988	3.323	1.950	0.137	27.755	0.622
		4	Simple mode	0.901	1.978	-2.975	4.777	2.462	0.051	118.758	0.680
		4	Weighted mode	0.850	1.953	-2.978	4.678	2.340	0.051	107.584	0.693
		4	MR-RAPS	0.461	1.130	-1.754	2.676	1.586	0.173	14.524	0.683
Beef intake	Prostate cancer	9	IVW_MRE	0.639	0.673	-0.680	1.959	1.895	0.507	7.090	0.342
		9	IVW_FE	0.639	0.715	-0.763	2.042	1.895	0.466	7.703	0.371
		9	MR-Egger	-2.677	4.301	-11.107	5.752	0.069	1.50E-05	314.897	0.553
		9	Weighted median	0.395	0.910	-1.388	2.178	1.484	0.250	8.826	0.664
		9	Simple mode	0.518	1.324	-2.076	3.112	1.679	0.125	22.475	0.706
		9	Weighted mode	0.395	1.120	-1.801	2.590	1.484	0.165	13.336	0.734
		9	MR-RAPS	0.605	0.749	-0.863	2.073	1.831	0.422	7.949	0.420
Non-oily fish intake	Prostate cancer	8	IVW_MRE	1.035	0.806	-0.544	2.614	2.815	0.580	13.652	0.199
		8	IVW_FE	1.035	0.789	-0.512	2.582	2.815	0.599	13.221	0.190
		8	MR-Egger	2.337	5.562	-8.564	13.239	10.353	1.91E-04	561582.966	0.689
		8	Weighted median	0.678	1.044	-1.368	2.725	1.971	0.255	15.252	0.516
		8	Simple mode	2.952	1.883	-0.738	6.641	19.137	0.478	766.156	0.161
		8	Weighted mode	-0.346	1.866	-4.002	3.311	0.708	0.018	27.412	0.858
		8	MR-RAPS	1.120	0.836	-0.519	2.759	3.065	0.595	15.777	0.180
Oily fish intake	Prostate cancer	47	IVW_MRE	0.629	0.282	0.077	1.182	1.877	1.080	3.260	0.025
		47	IVW_FE	0.629	0.251	0.137	1.122	1.877	1.147	3.070	0.012
		47	MR-Egger	0.486	1.261	-1.986	2.959	1.626	0.137	19.272	0.702
		47	Weighted median	0.360	0.378	-0.380	1.101	1.434	0.684	3.007	0.340
		47	Simple mode	0.003	0.883	-1.728	1.733	1.003	0.178	5.660	0.998

		47	Weighted mode	0.003	0.864	-1.690	1.695	1.003	0.185	5.448	0.997
		47	MR-RAPS	0.558	0.265	0.039	1.077	1.747	1.039	2.937	0.035
Pork intake	Prostate cancer	9	IVW_MRE	0.292	0.552	-0.790	1.374	1.339	0.454	3.952	0.597
		9	IVW_FE	0.292	0.835	-1.344	1.928	1.339	0.261	6.876	0.726
		9	MR-Egger	1.978	4.748	-7.328	11.284	7.226	6.57E-04	79499.508	0.689
		9	Weighted median	0.714	1.035	-1.315	2.743	2.042	0.269	15.535	0.490
		9	Simple mode	1.046	1.564	-2.019	4.110	2.845	0.133	60.953	0.522
		9	Weighted mode	1.153	1.525	-1.836	4.141	3.167	0.160	62.881	0.471
		9	MR-RAPS	0.340	0.869	-1.363	2.043	1.405	0.256	7.716	0.696
Lamb/mutton intake	Prostate cancer	24	IVW_MRE	-0.098	0.524	-1.125	0.929	0.907	0.325	2.532	0.852
		24	IVW_FE	-0.098	0.504	-1.086	0.890	0.907	0.338	2.435	0.846
		24	MR-Egger	1.601	2.675	-3.642	6.843	4.956	0.026	937.294	0.556
		24	Weighted median	-0.206	0.731	-1.639	1.226	0.813	0.194	3.409	0.778
		24	Simple mode	-0.340	1.352	-2.990	2.309	0.712	0.050	10.066	0.803
		24	Weighted mode	-0.340	1.252	-2.795	2.114	0.712	0.061	8.284	0.788
		24	MR-RAPS	-0.145	0.532	-1.188	0.898	0.865	0.305	2.454	0.785
Bread intake	Prostate cancer	25	IVW_MRE	0.416	0.358	-0.286	1.119	1.516	0.751	3.062	0.246
		25	IVW_FE	0.416	0.343	-0.256	1.088	1.516	0.774	2.970	0.225
		25	MR-Egger	-0.988	1.655	-4.231	2.255	0.372	0.015	9.539	0.556
		25	Weighted median	0.674	0.491	-0.289	1.636	1.962	0.749	5.134	0.170
		25	Simple mode	1.123	1.051	-0.936	3.183	3.075	0.392	24.114	0.296
		25	Weighted mode	1.123	1.025	-0.886	3.132	3.075	0.412	22.928	0.284
		25	MR-RAPS	0.517	0.361	-0.191	1.225	1.677	0.826	3.403	0.153
Cheese intake	Prostate cancer	50	IVW_MRE	-0.106	0.212	-0.521	0.309	0.899	0.594	1.361	0.616
		50	IVW_FE	-0.106	0.223	-0.542	0.330	0.899	0.581	1.391	0.633
		50	MR-Egger	0.306	0.975	-1.605	2.217	1.357	0.201	9.177	0.755
		50	Weighted median	-0.242	0.323	-0.875	0.391	0.785	0.417	1.478	0.453
		50	Simple mode	-0.831	0.817	-2.433	0.771	0.436	0.088	2.162	0.314
		50	Weighted mode	-0.904	0.828	-2.528	0.720	0.405	0.080	2.054	0.280
		50	MR-RAPS	-0.147	0.235	-0.608	0.314	0.863	0.545	1.368	0.531
Cooked vegetable intake	Prostate cancer	10	IVW_MRE	0.517	0.786	-1.023	2.057	1.677	0.360	7.824	0.510
		10	IVW_FE	0.517	0.725	-0.903	1.937	1.677	0.405	6.940	0.475
		10	MR-Egger	-3.192	9.465	-21.743	15.359	0.041	3.61E-10	4681102.418	0.745
		10	Weighted median	1.006	1.000	-0.953	2.965	2.735	0.386	19.398	0.314
		10	Simple mode	1.860	1.747	-1.564	5.285	6.427	0.209	197.261	0.315

		10	Weighted mode	1.795	1.650	-1.439	5.029	6.019	0.237	152.764	0.305
		10	MR-RAPS	0.610	0.767	-0.893	2.113	1.840	0.409	8.276	0.426
Tea intake	Prostate cancer	34	IVW_MRE	0.195	0.280	-0.353	0.743	1.215	0.703	2.102	0.485
		34	IVW_FE	0.195	0.265	-0.324	0.714	1.215	0.723	2.042	0.461
		34	MR-Egger	1.077	0.896	-0.680	2.834	2.936	0.507	17.013	0.238
		34	Weighted median	0.277	0.396	-0.499	1.054	1.320	0.607	2.869	0.484
		34	Simple mode	0.306	0.684	-1.036	1.647	1.357	0.355	5.190	0.658
		34	Weighted mode	0.329	0.591	-0.830	1.487	1.389	0.436	4.424	0.582
		34	MR-RAPS	0.232	0.278	-0.313	0.777	1.261	0.731	2.175	0.404
Green tea intake	Prostate cancer	21	IVW_MRE	-0.015	0.007	-0.029	-3.57E-04	0.985	0.971	1.000	0.045
		21	IVW_FE	-0.015	0.006	-0.027	-0.003	0.985	0.974	0.997	0.014
		21	MR-Egger	-0.026	0.015	-0.055	0.002	0.974	0.946	1.002	0.089
		21	Weighted median	-0.011	0.009	-0.029	0.008	0.989	0.971	1.008	0.252
		21	Simple mode	-0.008	0.017	-0.042	0.026	0.992	0.959	1.026	0.654
		21	Weighted mode	-0.017	0.013	-0.043	0.009	0.983	0.958	1.009	0.213
		21	MR-RAPS	-0.016	0.007	-0.029	-0.003	0.984	0.971	0.997	0.013
Fresh fruit intake	Prostate cancer	37	IVW_MRE	0.521	0.489	-0.438	1.480	1.684	0.645	4.394	0.287
		37	IVW_FE	0.521	0.450	-0.361	1.403	1.684	0.697	4.067	0.247
		37	MR-Egger	1.562	1.655	-1.682	4.807	4.770	0.186	122.320	0.352
		37	Weighted median	1.280	0.698	-0.087	2.647	3.597	0.917	14.115	0.066
		37	Simple mode	0.154	1.458	-2.703	3.011	1.167	0.067	20.306	0.916
		37	Weighted mode	0.990	1.060	-1.088	3.067	2.690	0.337	21.472	0.357
		37	MR-RAPS	0.631	0.475	-0.300	1.562	1.879	0.741	4.768	0.183
Cereal intake	Prostate cancer	24	IVW_MRE	0.584	0.368	-0.136	1.305	1.794	0.873	3.687	0.112
		24	IVW_FE	0.584	0.396	-0.192	1.361	1.794	0.825	3.900	0.140
		24	MR-Egger	-2.319	2.045	-6.327	1.689	0.098	0.002	5.414	0.269
		24	Weighted median	1.063	0.561	-0.036	2.162	2.895	0.964	8.692	0.058
		24	Simple mode	1.348	1.115	-0.838	3.534	3.850	0.433	34.247	0.239
		24	Weighted mode	1.369	1.140	-0.866	3.604	3.931	0.421	36.750	0.242
		24	MR-RAPS	0.720	0.418	-0.099	1.539	2.054	0.905	4.661	0.085
Salad/raw vegetable intake	Prostate cancer	14	IVW_MRE	1.039	0.618	-0.171	2.250	2.827	0.842	9.486	0.092
		14	IVW_FE	1.039	0.761	-0.453	2.532	2.827	0.636	12.573	0.172
		14	MR-Egger	1.167	3.475	-5.644	7.979	3.213	0.004	2918.513	0.743
		14	Weighted median	0.858	0.985	-1.072	2.788	2.358	0.342	16.244	0.384
		14	Simple mode	2.724	1.666	-0.542	5.989	15.234	0.581	399.196	0.126

		14	Weighted mode	2.300	1.558	-0.753	5.353	9.973	0.471	211.229	0.164
		14	MR-RAPS	1.070	0.798	-0.494	2.634	2.915	0.610	13.930	0.178
Coffee intake	Prostate cancer	25	IVW_MRE	-0.656	0.476	-1.589	0.276	0.519	0.204	1.318	0.168
		25	IVW_FE	-0.656	0.405	-1.451	0.138	0.519	0.234	1.148	0.105
		25	MR-Egger	0.876	1.540	-2.142	3.894	2.401	0.117	49.112	0.575
		25	Weighted median	-0.157	0.618	-1.368	1.054	0.855	0.255	2.869	0.799
		25	Simple mode	-1.543	1.231	-3.956	0.871	0.214	0.019	2.389	0.222
		25	Weighted mode	-0.860	0.989	-2.799	1.079	0.423	0.061	2.940	0.393
		25	MR-RAPS	-0.713	0.430	-1.556	0.130	0.490	0.211	1.139	0.097
Dried fruit intake	Prostate cancer	28	IVW_MRE	0.344	0.410	-0.460	1.148	1.411	0.631	3.153	0.402
		28	IVW_FE	0.344	0.387	-0.414	1.102	1.411	0.661	3.010	0.374
		28	MR-Egger	-3.315	2.342	-7.905	1.275	0.036	3.69E-04	3.577	0.169
		28	Weighted median	0.687	0.553	-0.397	1.771	1.989	0.673	5.880	0.214
		28	Simple mode	0.932	1.118	-1.260	3.123	2.539	0.284	22.718	0.412
		28	Weighted mode	0.497	1.062	-1.584	2.579	1.644	0.205	13.183	0.643
		28	MR-RAPS	0.539	0.409	-0.263	1.341	1.714	0.769	3.821	0.187

Abbreviations: CI, confidence interval; IVW_FE, inverse variance weighted fixed effects model; IVW_MRE, inverse variance weighted multiplicative random effects model; MR-Egger, Mendelian randomization Egger; MR-RAPS, Mendelian randomization Robust Adjusted Profile Score; OR, odds ratio; SE: standard error; SNPs: single nucleotide polymorphisms.

Supplementary Table 9 Using different methods to evaluate the heterogeneity and pleiotropy of 22 dietary factors on PCa

Exposure	Outcome	NSNPs	Heterogeneity (Cochran's *Q* test)[(1)]				Horizontal pleiotropy[(2)]			MR-PRESSO (Raw)[(3)]				MR-PRESSO (outlier-corrected)[(3)]	MR-PRESSO (Global Test)[(4)]	
			method	*Q*	*Q*_df	*Q*_pval	MR-Egger intercept	SE	*p*-value	casual estimate	sd	T-stat	*p*-value	Outliers	RSSobs	*p*-value
Alcohol intake frequency	Prostate cancer	72	MR Egger	88.120	70	0.071	0.003	0.012	0.801	0.094	0.145	0.648	0.519	NA	90.707	0.081
			IVW	88.201	71	0.081										
Average weekly red wine intake	Prostate cancer	10	MR Egger	13.360	8	0.100	0.058	0.066	0.406	0.982	0.749	1.311	0.222	NA	18.955	0.094
			IVW	14.645	9	0.101										
Average weekly champagne plus white wine intake	Prostate cancer	3	MR Egger	0.370	1	0.543	-0.627	0.319	0.300	/	/	/	/	/	/	/
			IVW	4.220	2	0.121										
Average weekly spirits intake	Prostate cancer	3	MR Egger	3.885	1	0.049	-0.129	0.121	0.480	/	/	/	/	/	/	/
			IVW	8.291	2	0.016										
Average weekly beer plus cider intake	Prostate cancer	12	MR Egger	11.597	10	0.313	-0.041	0.035	0.265	1.196	0.637	1.878	0.087	NA	16.308	0.269
			IVW	13.212	11	0.280										
Processed meat intake	Prostate cancer	18	MR Egger	14.472	16	0.564	-0.009	0.031	0.767	-0.631	0.367	-1.718	0.104	NA	16.233	0.643
			IVW	14.562	17	0.627										
Poultry intake	Prostate cancer	4	MR Egger	3.098	2	0.212	-0.026	0.492	0.963	0.395	1.086	0.363	0.740	NA	5.544	0.430
			IVW	3.103	3	0.376										
Beef intake	Prostate cancer	9	MR Egger	6.470	7	0.486	0.041	0.052	0.460	0.639	0.673	0.950	0.370	NA	8.608	0.567
			IVW	7.081	8	0.528										
Non-oily fish intake	Prostate cancer	8	MR Egger	7.226	6	0.300	-0.014	0.061	0.820	1.035	0.806	1.285	0.240	NA	9.574	0.415
			IVW	7.294	7	0.399										
Oily fish intake	Prostate cancer	47	MR Egger	57.879	45	0.094	0.002	0.018	0.908	0.629	0.282	2.234	0.030	NA	61.003	0.110
			IVW	57.897	46	0.112										
Pork intake	Prostate cancer	9	MR Egger	3.371	7	0.849	-0.017	0.047	0.729	0.292	0.552	0.529	0.611	NA	4.441	0.885
			IVW	3.501	8	0.899										
Lamb/mutton intake	Prostate cancer	24	MR Egger	24.404	22	0.326	-0.018	0.028	0.524	-0.098	0.524	-0.187	0.853	NA	26.958	0.359
			IVW	24.870	23	0.357										
Bread intake	Prostate cancer	25	MR Egger	25.397	23	0.330	0.020	0.023	0.394	0.416	0.358	1.161	0.257	NA	28.827	0.337
			IVW	26.231	24	0.342										
Cheese intake	Prostate cancer	50	MR Egger	44.080	48	0.634	-0.007	0.016	0.666	-0.106	0.212	-0.502	0.618	NA	46.256	0.625
			IVW	44.268	49	0.665										
Cooked vegetable intake	Prostate cancer	10	MR Egger	10.383	8	0.239	0.039	0.099	0.704	0.517	0.786	0.658	0.527	NA	12.920	0.315
			IVW	10.584	9	0.305										

Tea intake	Prostate cancer	34	MR Egger	35.601	32	0.303	-0.015	0.015	0.308	0.195	0.280	0.698	0.490	NA	38.750	0.312
			IVW	36.794	33	0.297										
Green tea intake	Prostate cancer	21	MR Egger	28.992	19	0.066	0.035	0.038	0.375	-0.015	0.007	-2.008	0.058	NA	33.705	0.072
			IVW	30.252	20	0.066										
Fresh fruit intake	Prostate cancer	37	MR Egger	42.060	35	0.192	-0.009	0.014	0.514	0.521	0.489	1.064	0.294	NA	44.954	0.211
			IVW	42.582	36	0.209										
Cereal intake	Prostate cancer	24	MR Egger	17.695	22	0.724	0.039	0.027	0.162	0.584	0.368	1.590	0.125	NA	21.805	0.655
			IVW	19.789	23	0.655										
Salad/raw vegetable intake	Prostate cancer	14	MR Egger	8.552	12	0.741	-0.001	0.037	0.970	1.039	0.618	1.682	0.116	NA	9.872	0.810
			IVW	8.554	13	0.806										
Coffee intake	Prostate cancer	25	MR Egger	31.572	23	0.109	-0.021	0.020	0.306	-0.656	0.476	-1.379	0.181	NA	35.562	0.110
			IVW	33.074	24	0.103										
Dried fruit intake	Prostate cancer	28	MR Egger	27.722	26	0.372	0.043	0.027	0.125	0.344	0.410	0.838	0.409	NA	32.821	0.291
			IVW	30.403	27	0.296										

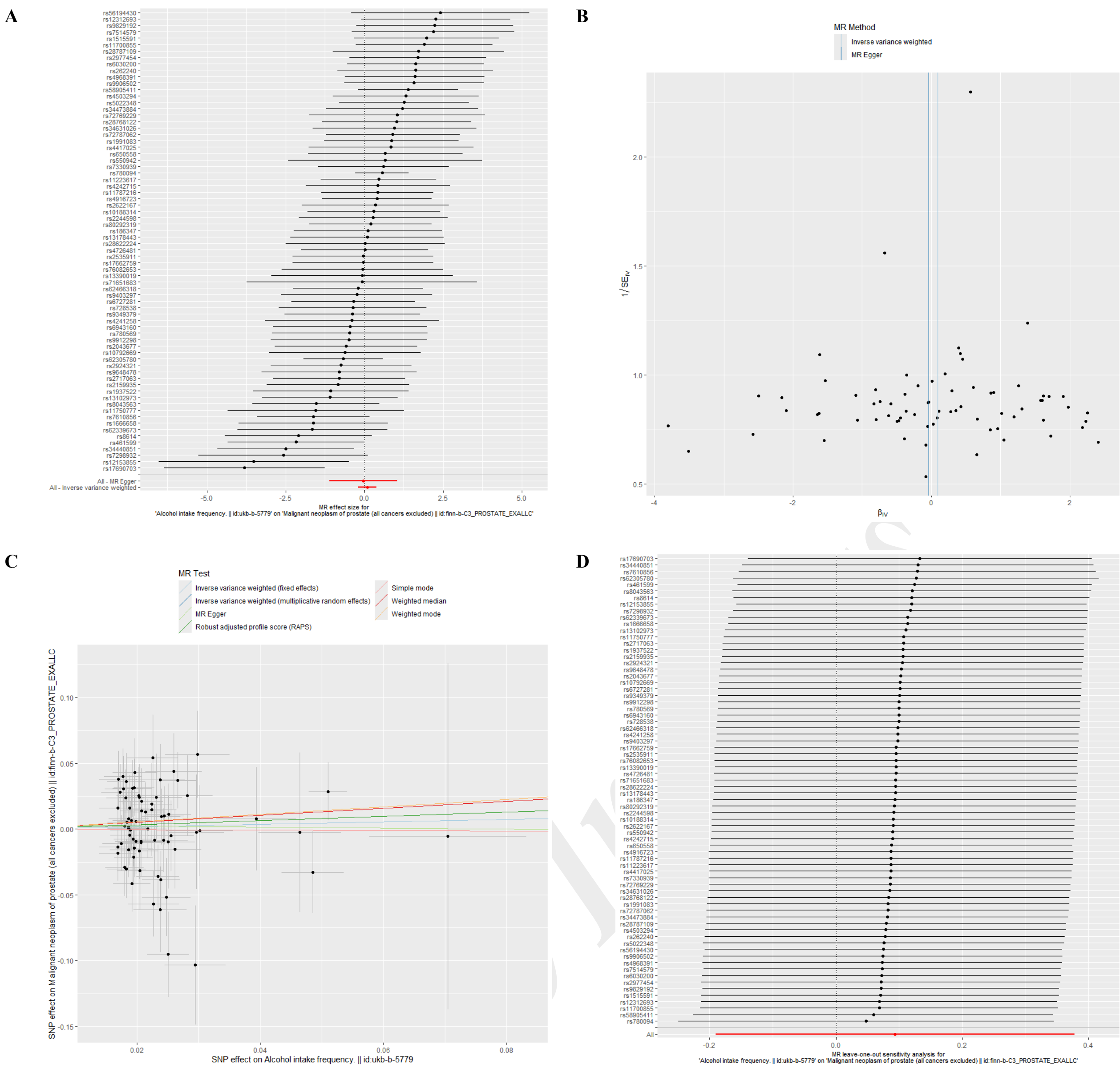
Note: (1) The Cochran's Q test was a statistical test for heterogeneity. (2) The intercept term from the MR-Egger regression method was a statistical test of horizontal pleiotropy. (3) The MR-PRESSO outlier test (Raw and Outlier-corrected) method detected the existence of outlier IVs and the analysis results after removing the outlier IVs. (4) The MR-PRESSO global test method detects horizontal pleiotropy.

Abbreviations: IVW, inverse variance weighted; MR-PRESSO, Mendelian Randomization Pleiotropy RESidual Sum and Outlier; SE, standard error; SNPs, single nucleotide polymorphisms.

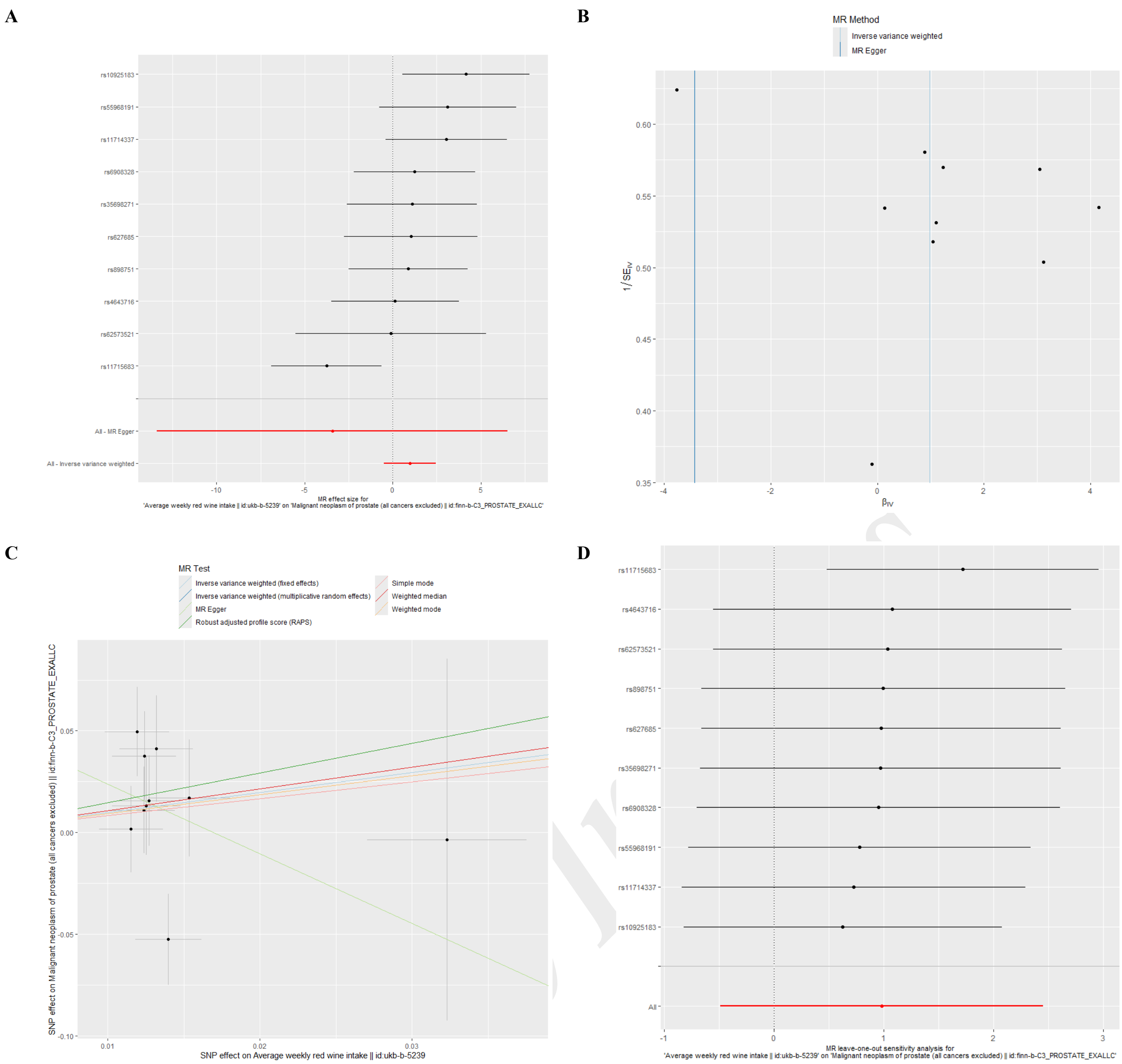
Supplementary Table 10 Statistical power for the MR analysis of dietary factors and the risk of PCa

Exposure	R^2	Outcome	Sample size	Proportion of cases	Type-I error rate	OR	Statistical power
Average weekly beer plus cider intake	0.143%	Prostate cancer	80,996	0.341	0.05	3.305	100%
Oily fish intake	0.440%	Prostate cancer	80,996	0.341	0.05	1.877	100%
Green tea intake	1.072%	Prostate cancer	80,996	0.341	0.05	0.985	5%

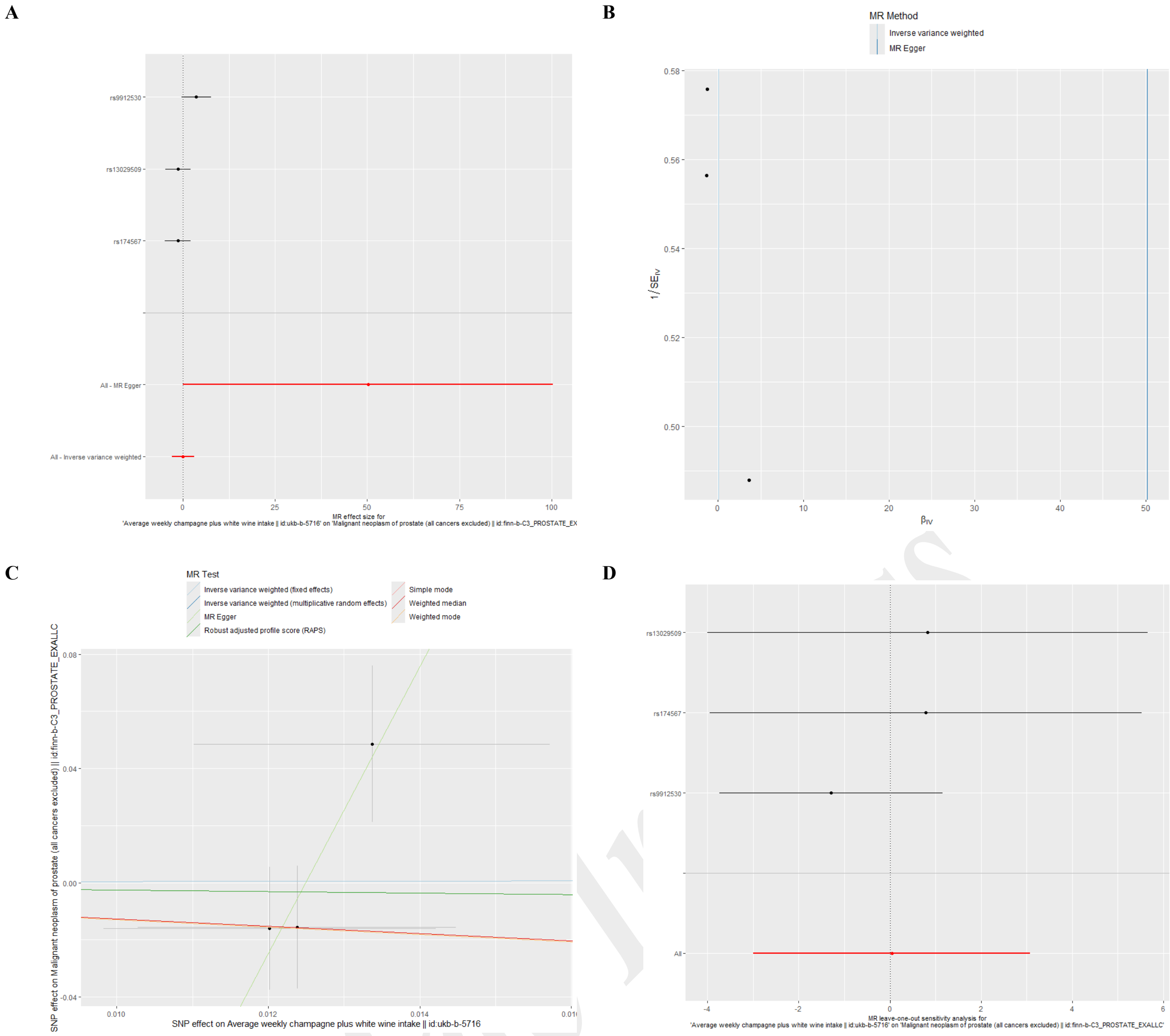
Abbreviations: R2, proportion of variance explained for the association between the SNPs and the exposure variable; OR, True odds ratio of the outcome variable per standard deviation of the exposure variable.



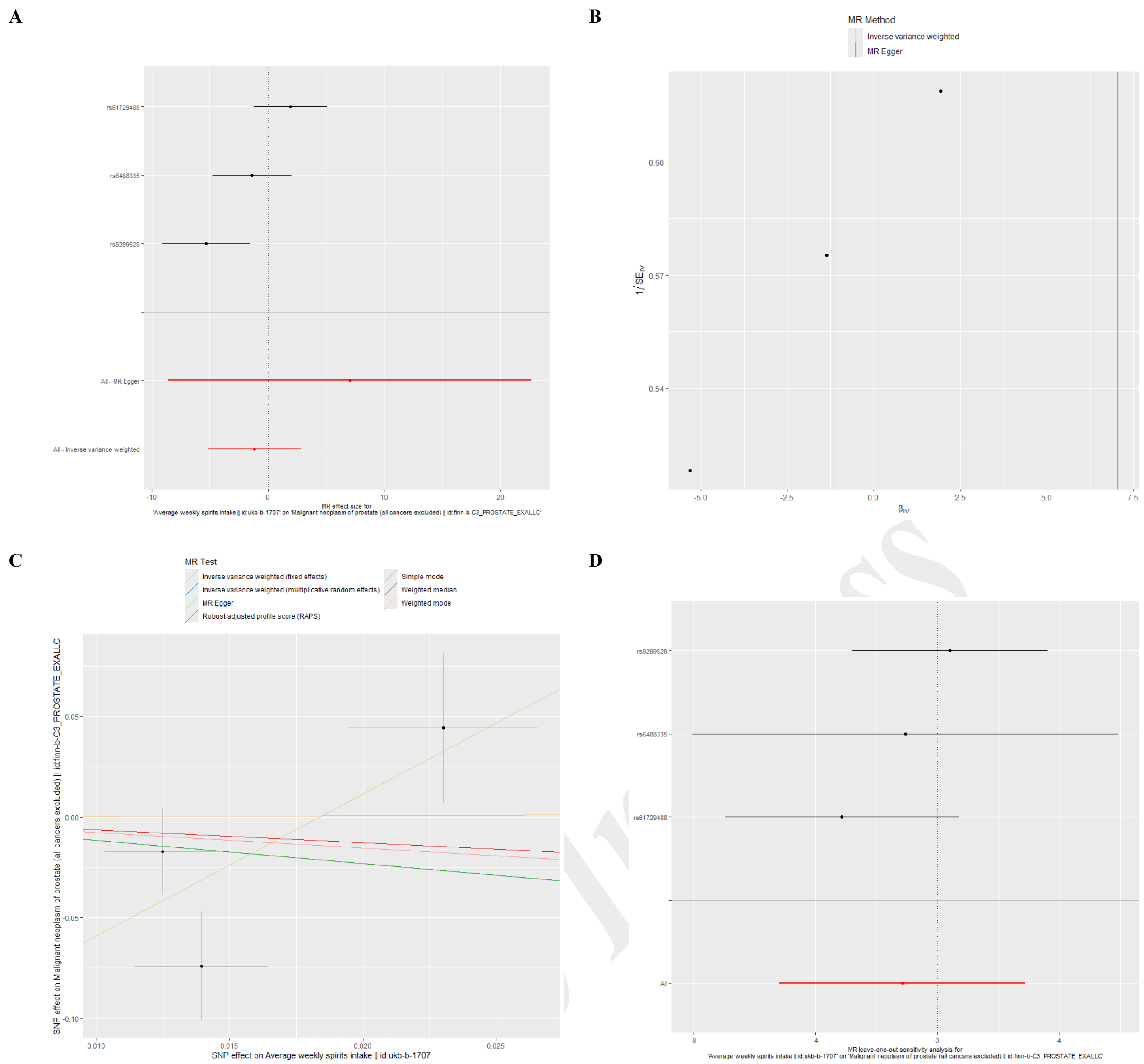
Supplementary Figure 1 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between alcohol intake frequency and PCa in MR analysis



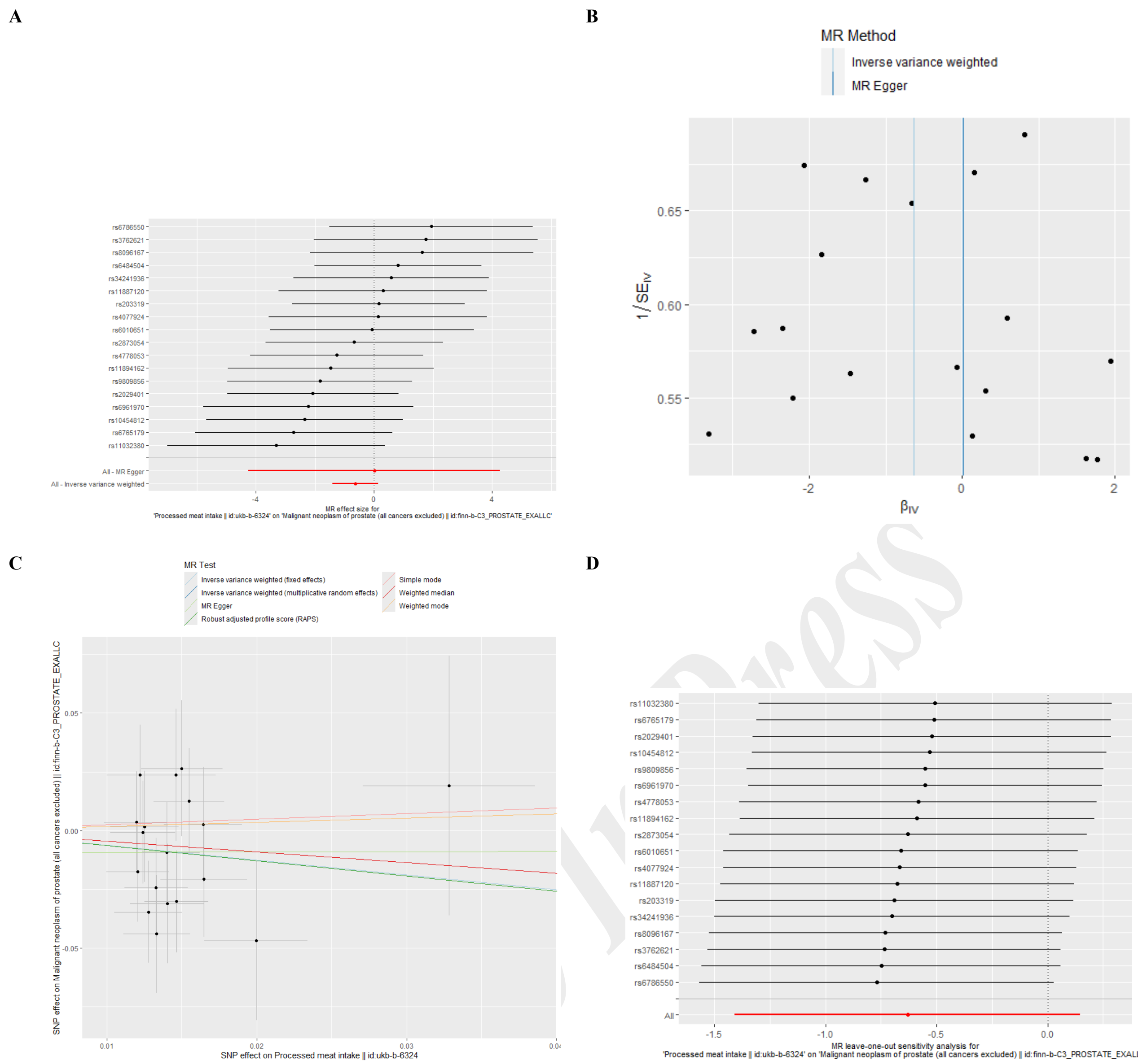
Supplementary Figure 2 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between average weekly red wine intake and PCa in MR analysis



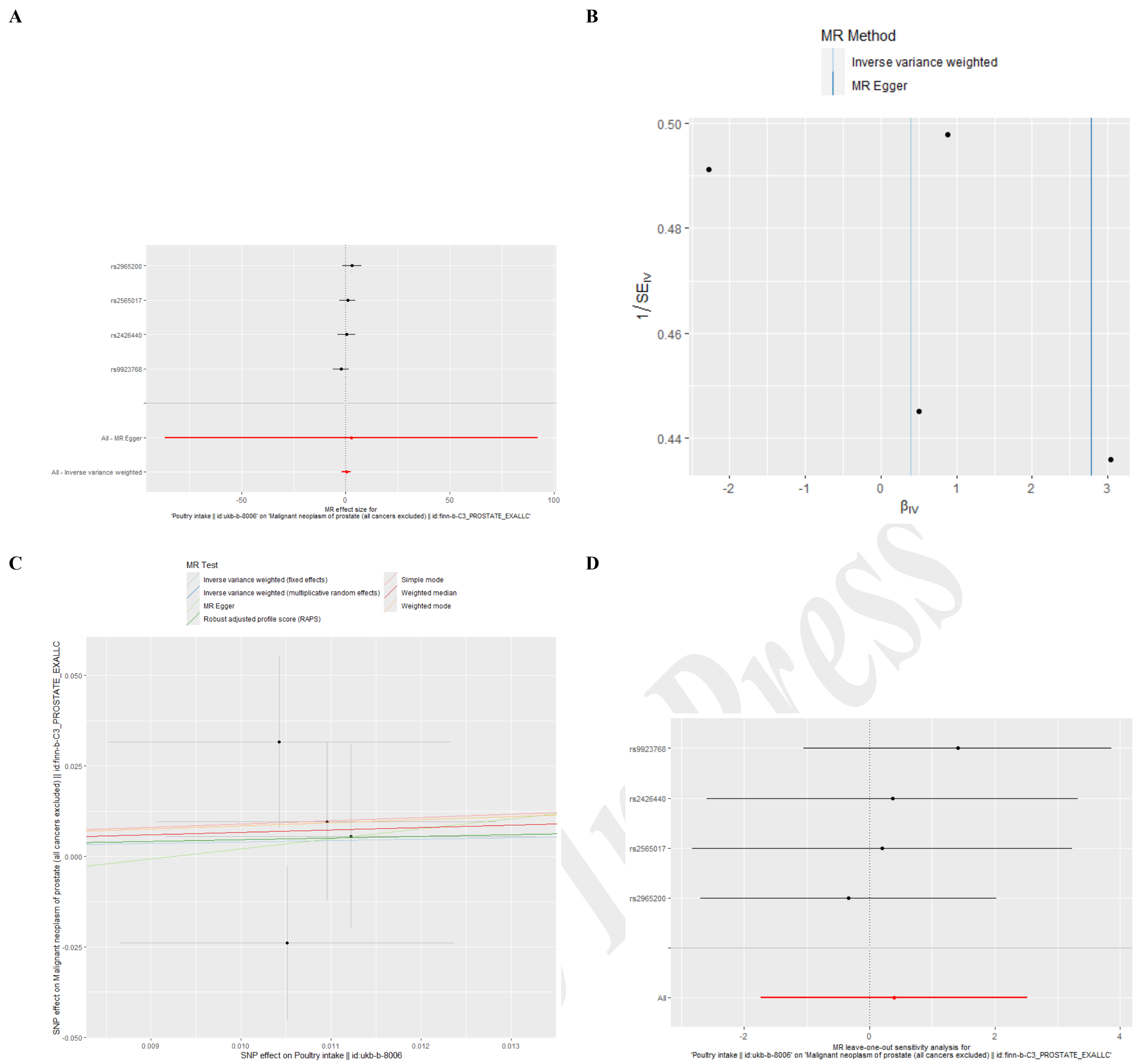
Supplementary Figure 3 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between average weekly champagne plus white wine intake and PCa in MR analysis



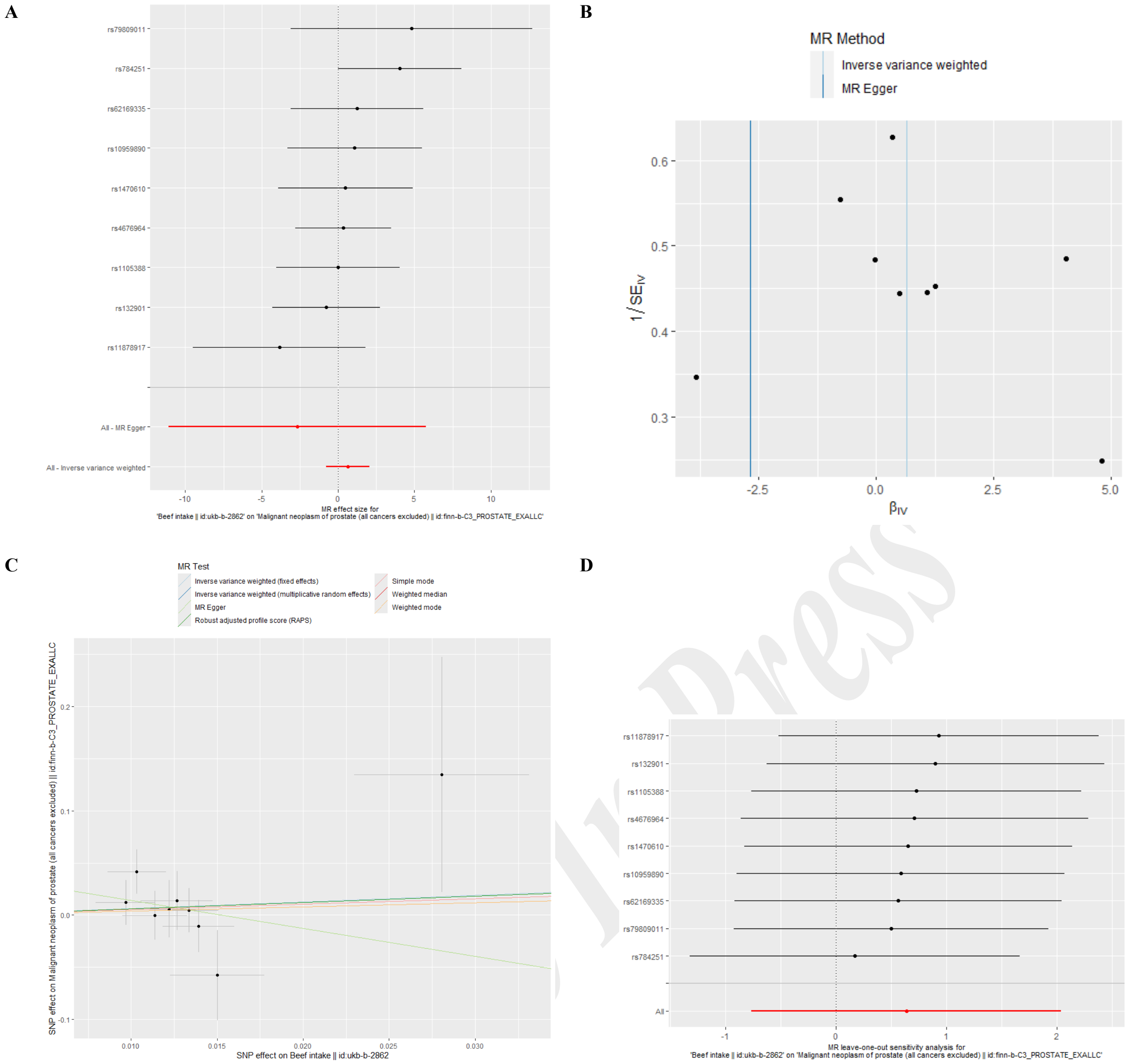
Supplementary Figure 4 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between average weekly spirits intake and PCa in MR analysis



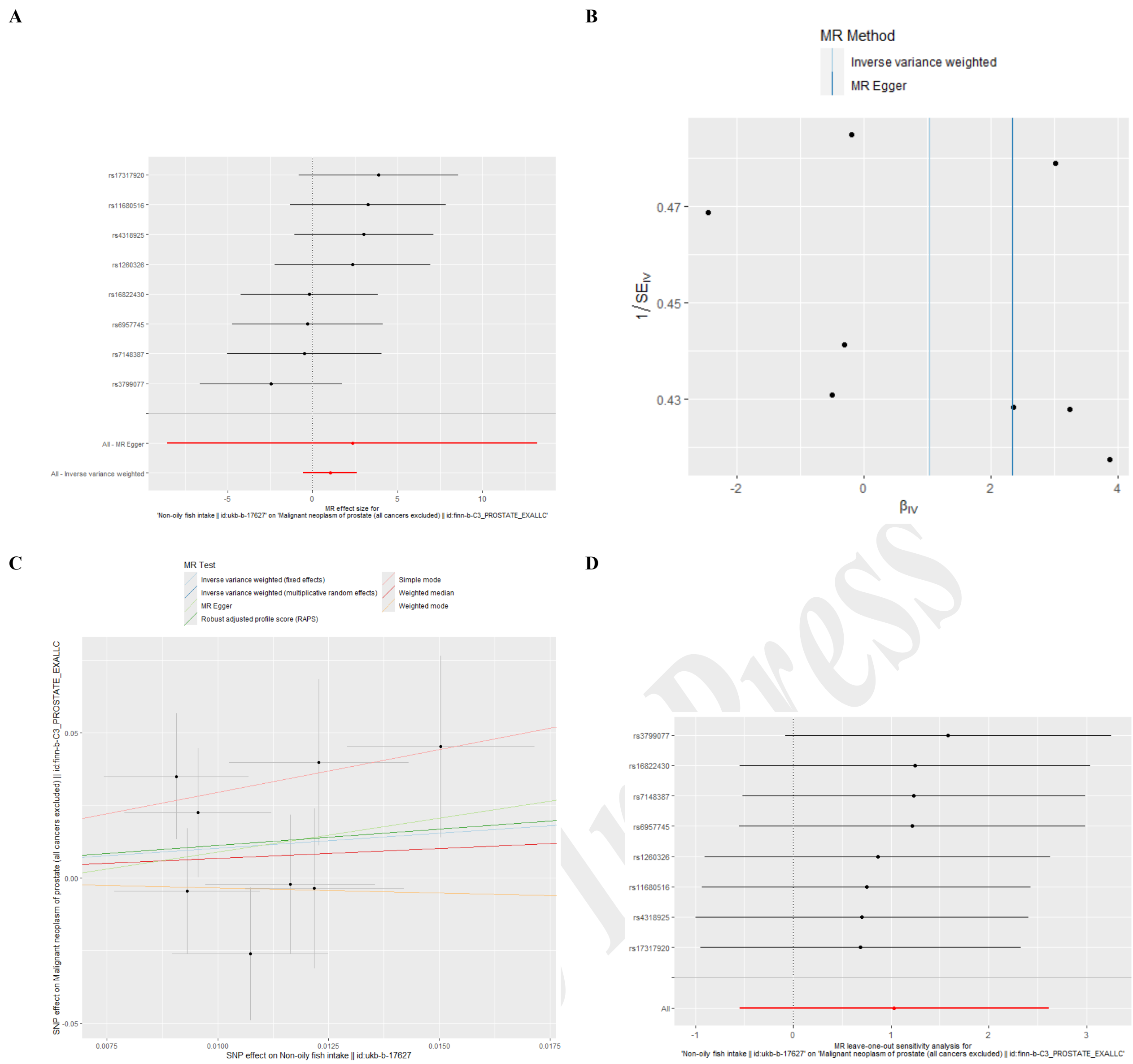
Supplementary Figure 5 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between processed meat intake and PCa in MR analysis



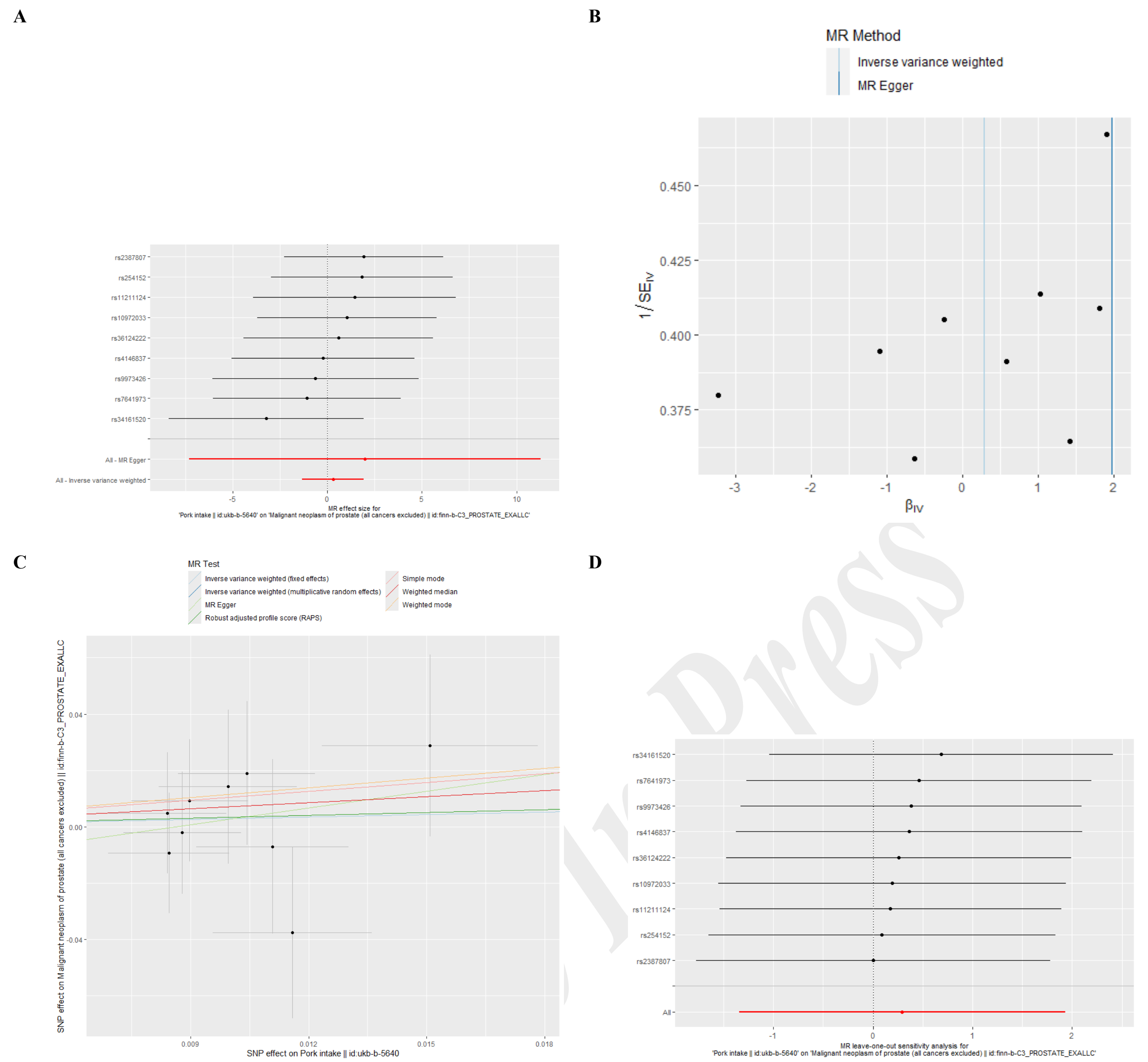
Supplementary Figure 6 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between poultry intake and PCa in MR analysis



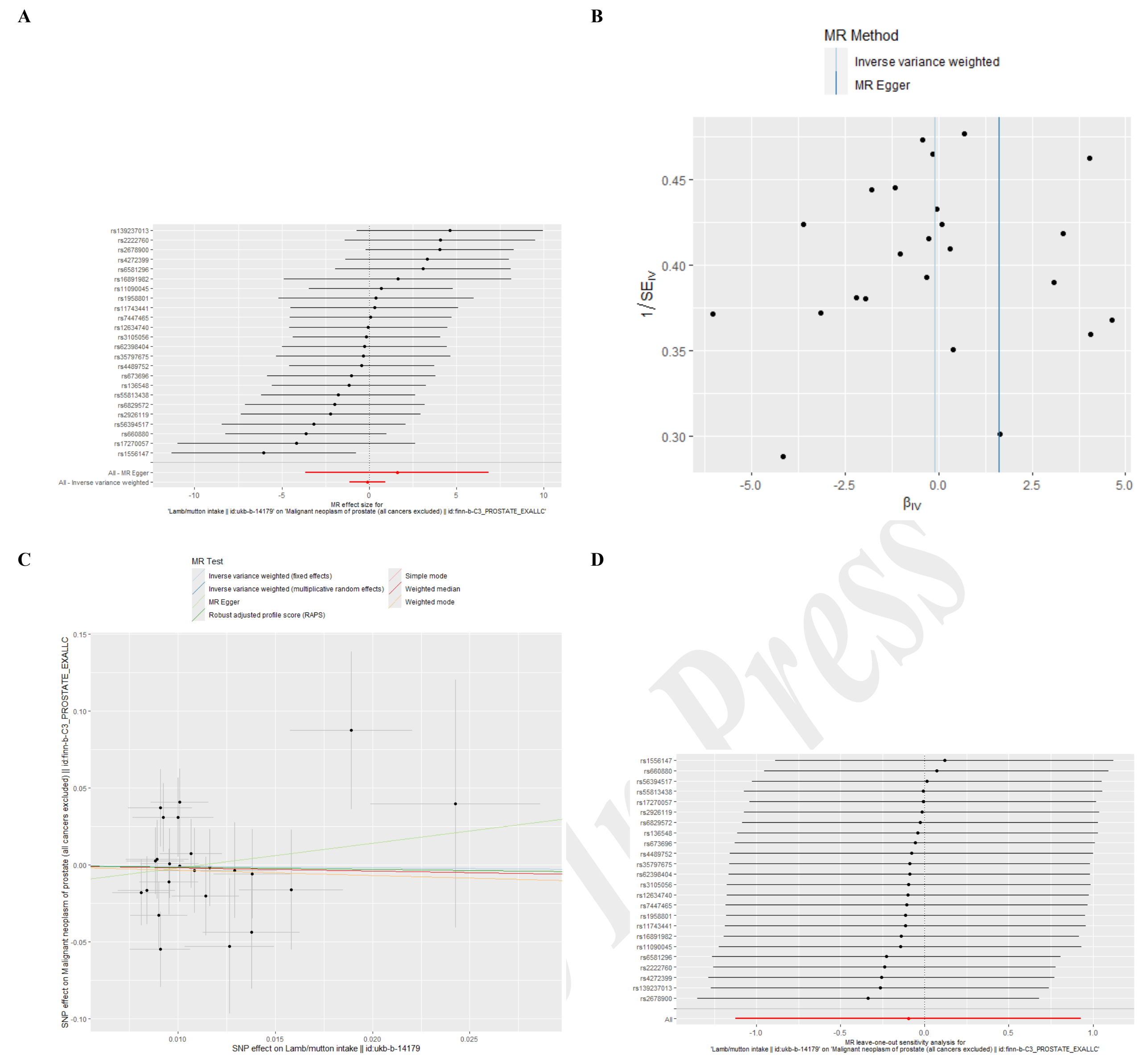
Supplementary Figure 7 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between beef intake and PCa in MR analysis



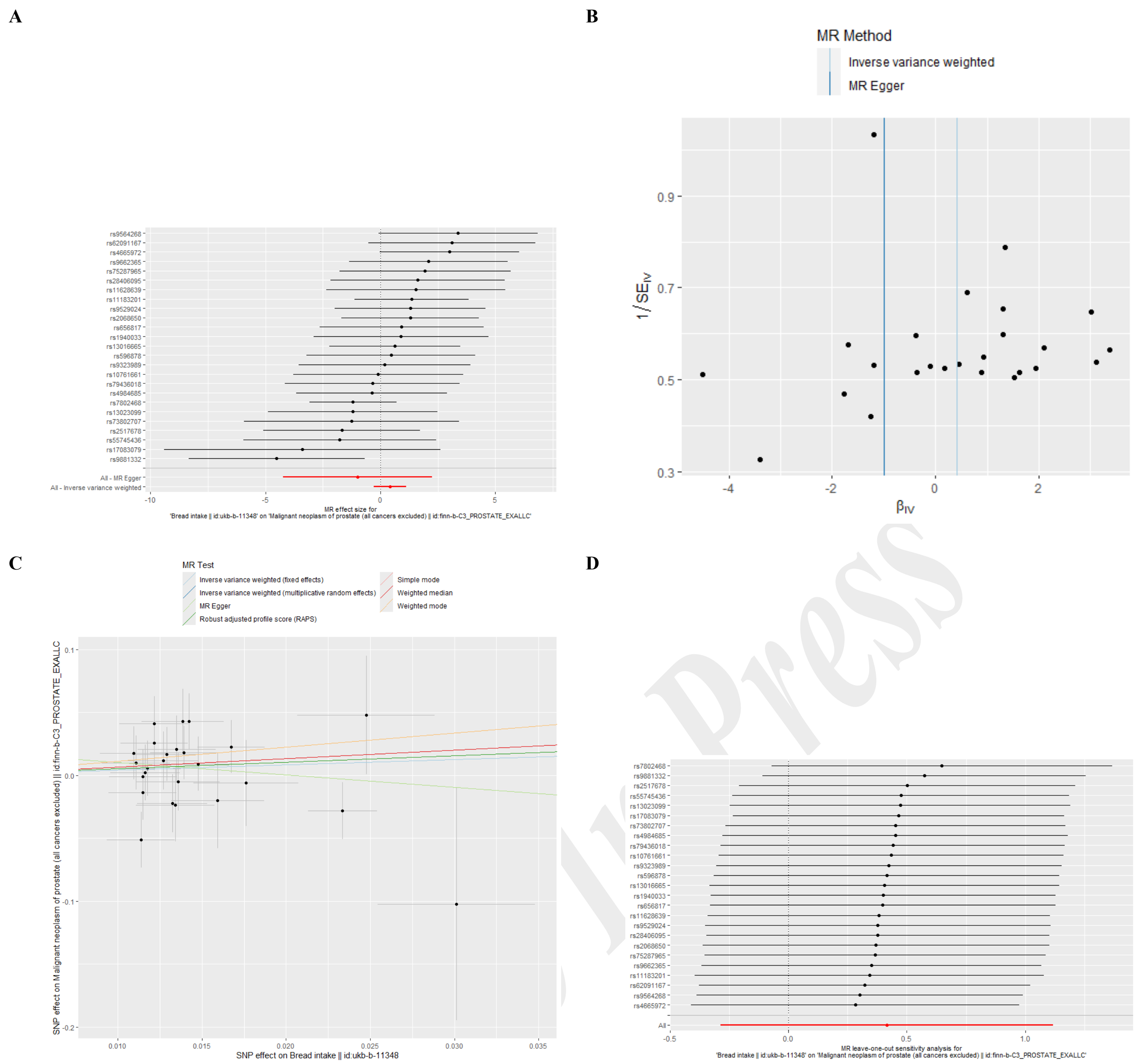
Supplementary Figure 8 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between non-oily fish intake and PCa in MR analysis



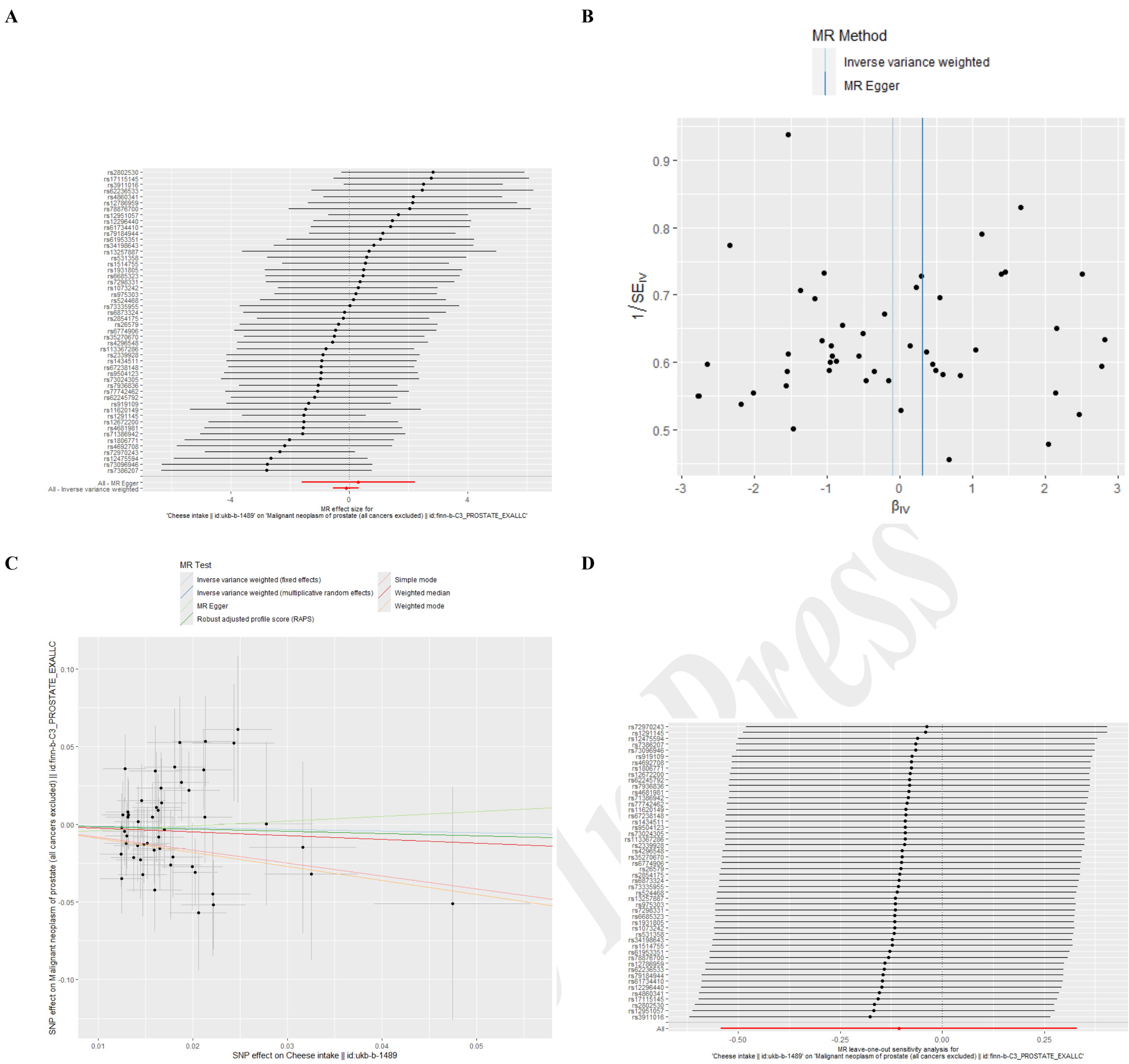
Supplementary Figure 9 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between pork intake and PCa in MR analysis



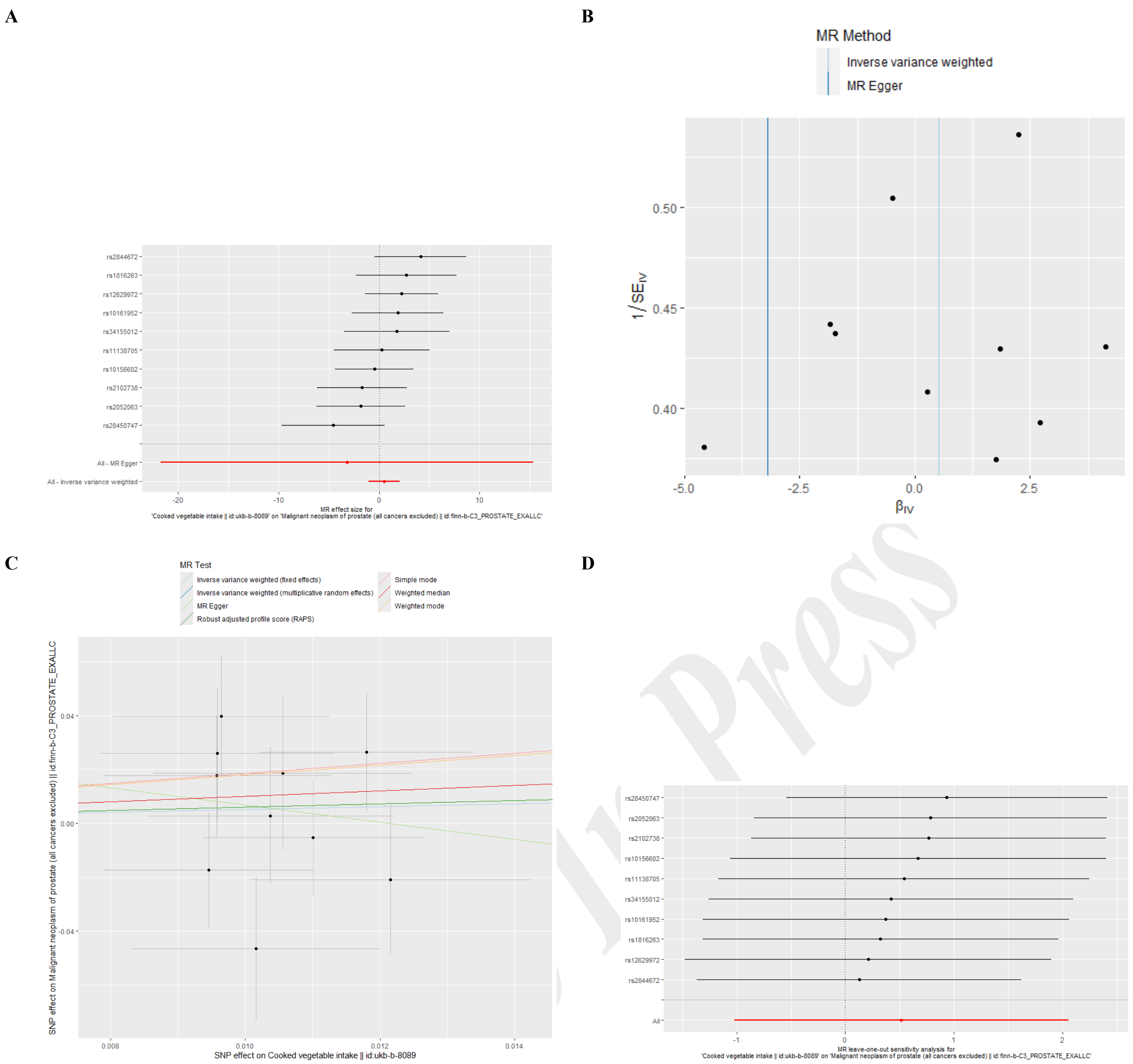
Supplementary Figure 10 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between lamb/mutton intake and PCa in MR analysis



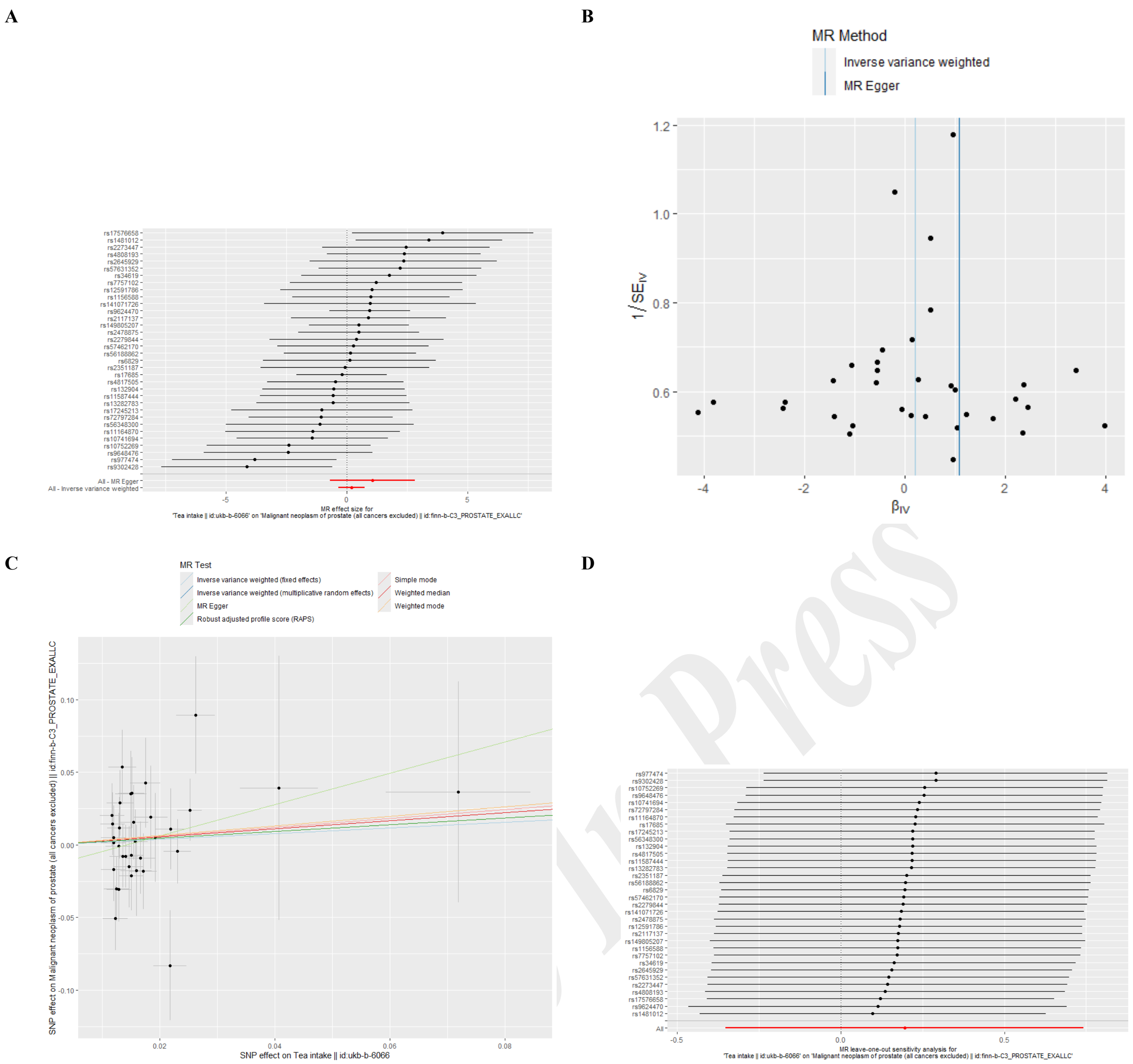
Supplementary Figure 11 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between bread intake and PCa in MR analysis



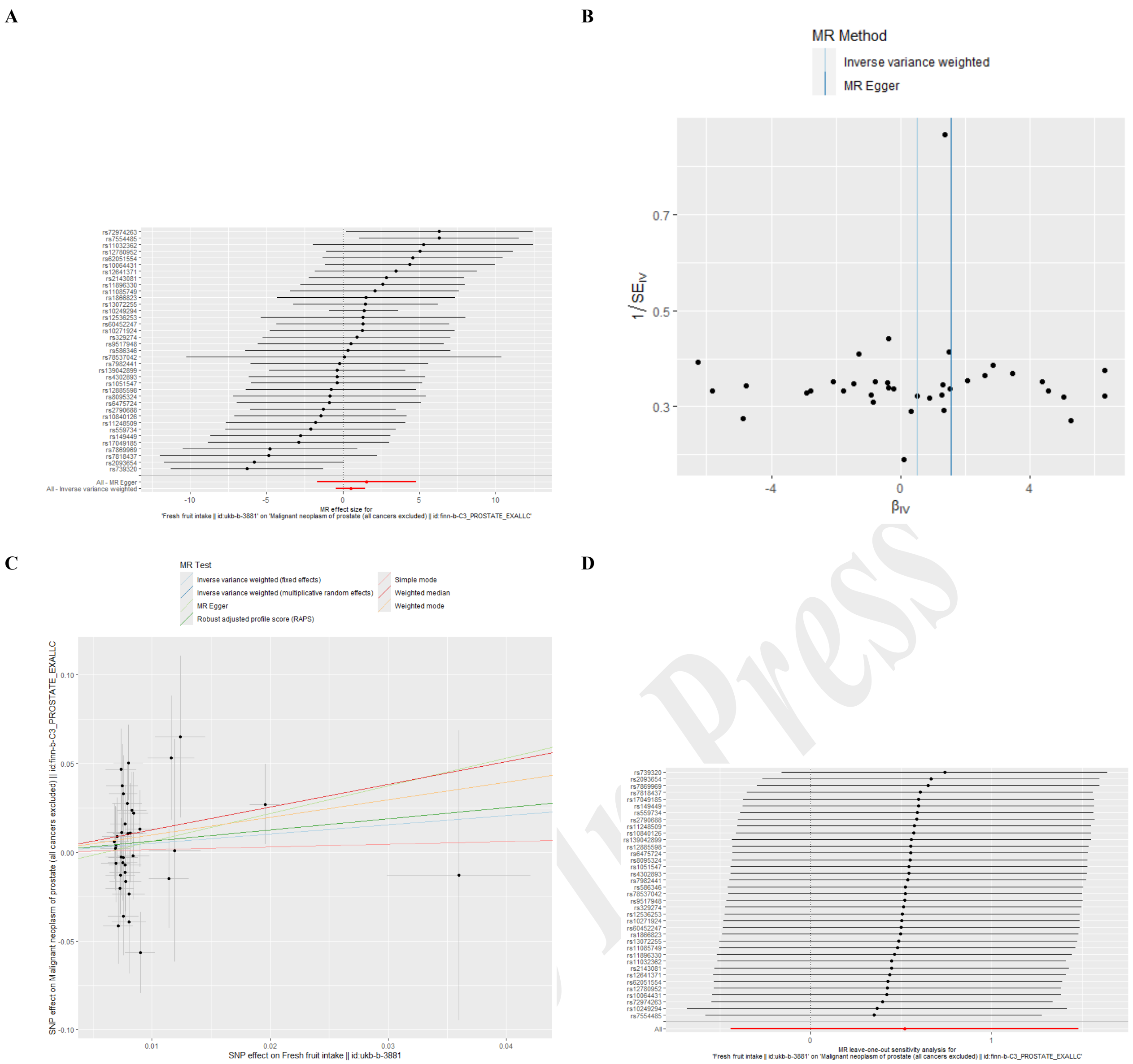
Supplementary Figure 12 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between cheese intake and PCa in MR analysis



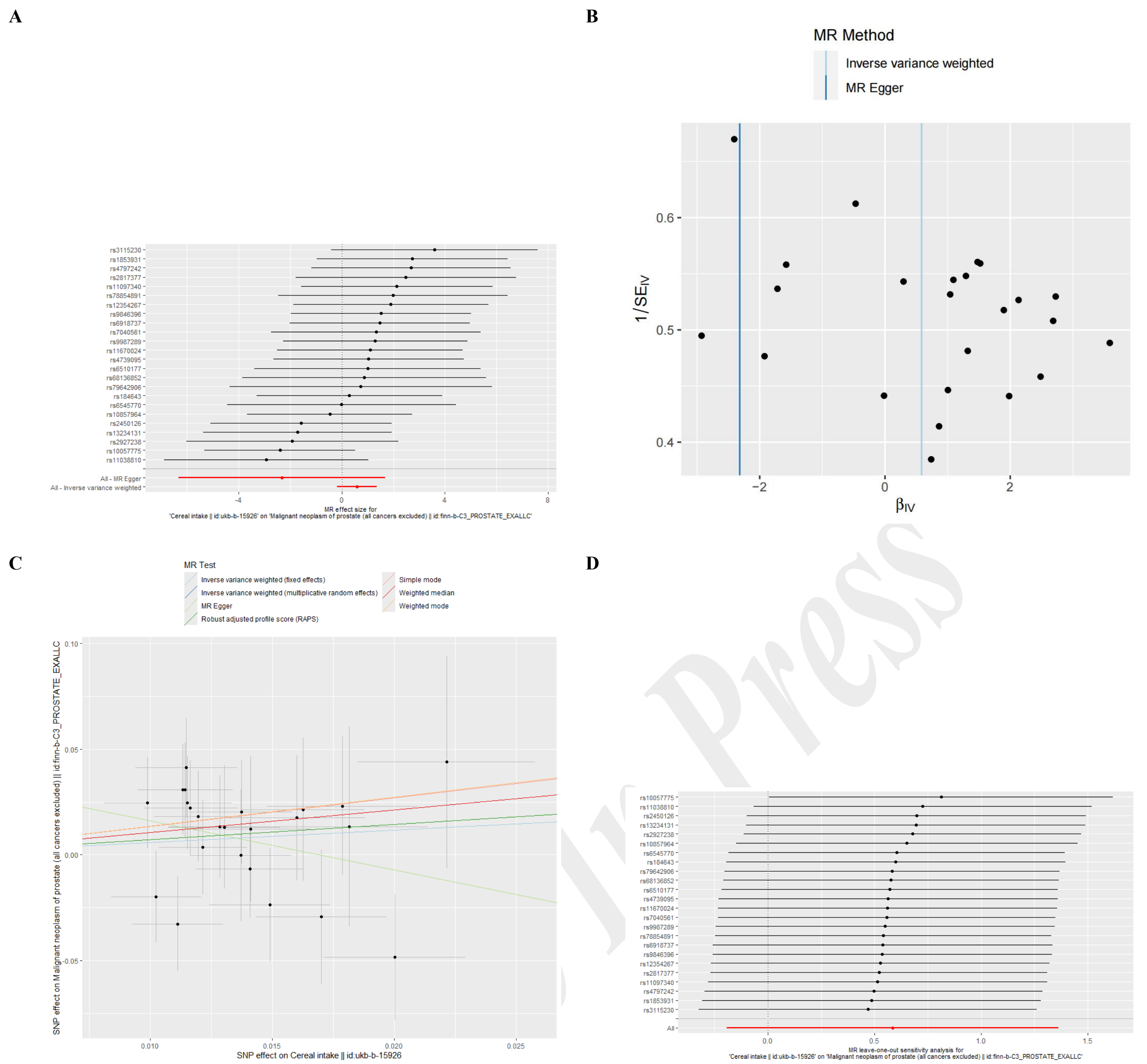
Supplementary Figure 13 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between cooked vegetable intake and PCa in MR analysis



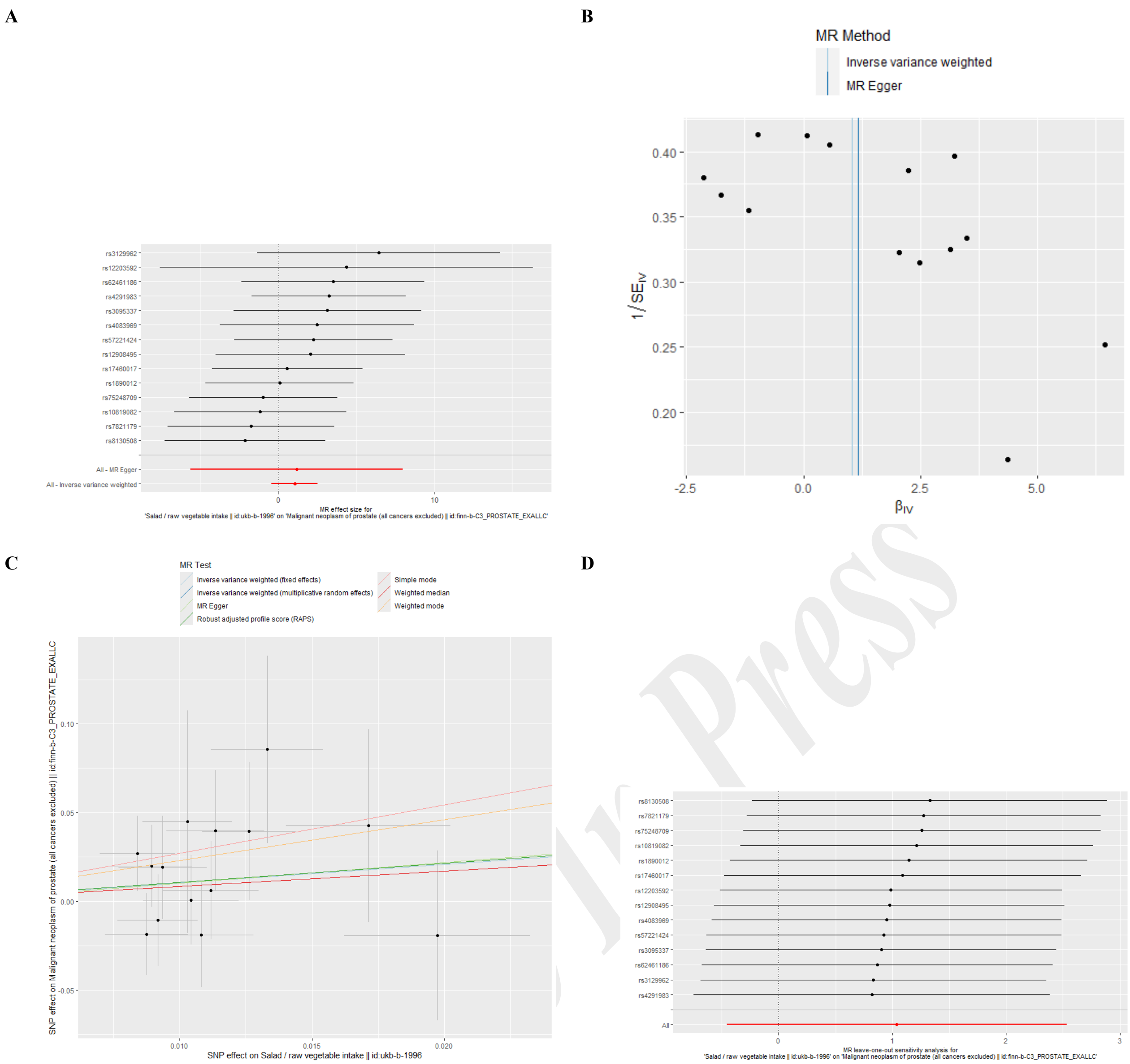
Supplementary Figure 14 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between tea intake and PCa in MR analysis



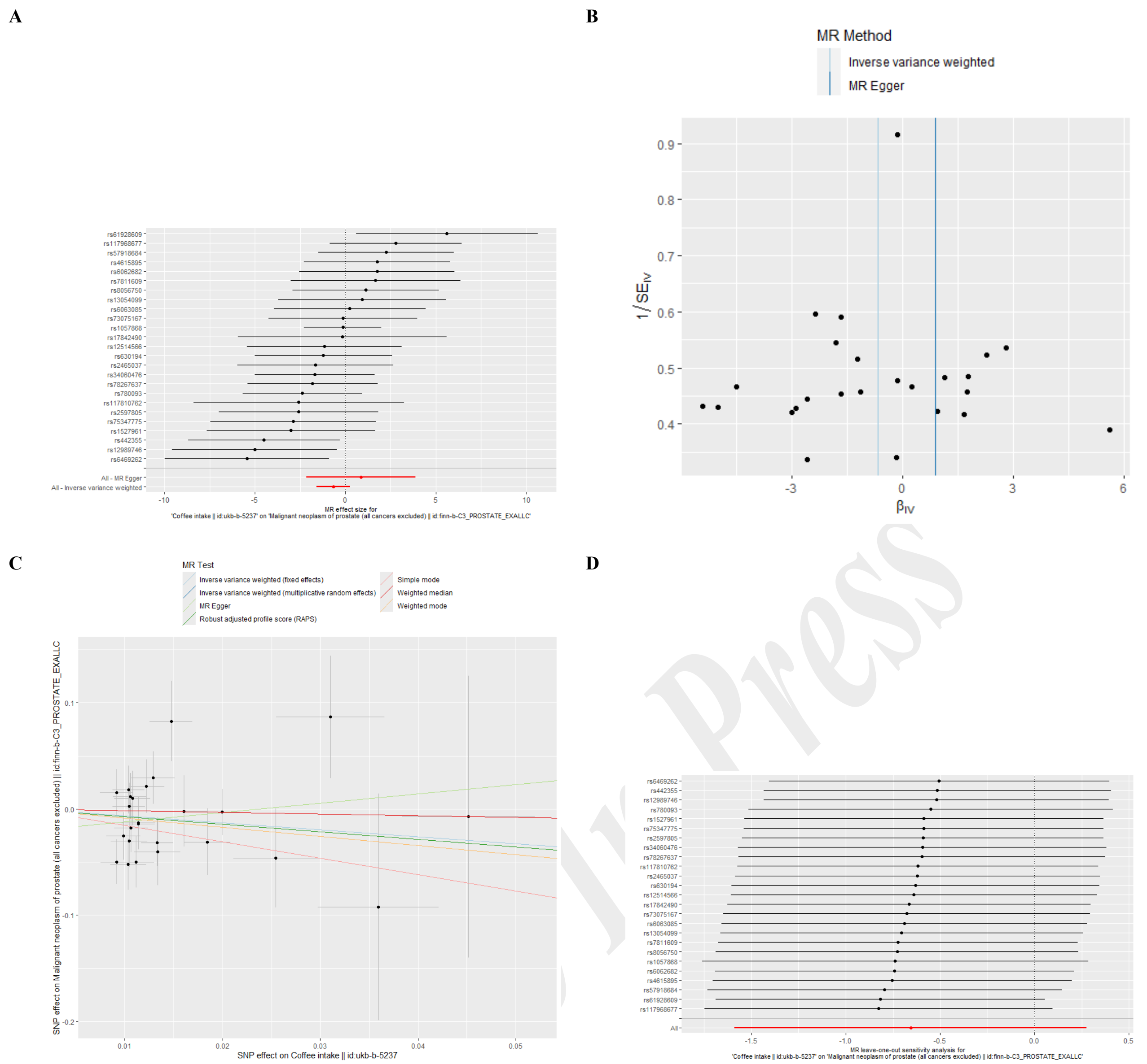
Supplementary Figure 15 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between fresh fruit intake and PCa in MR analysis



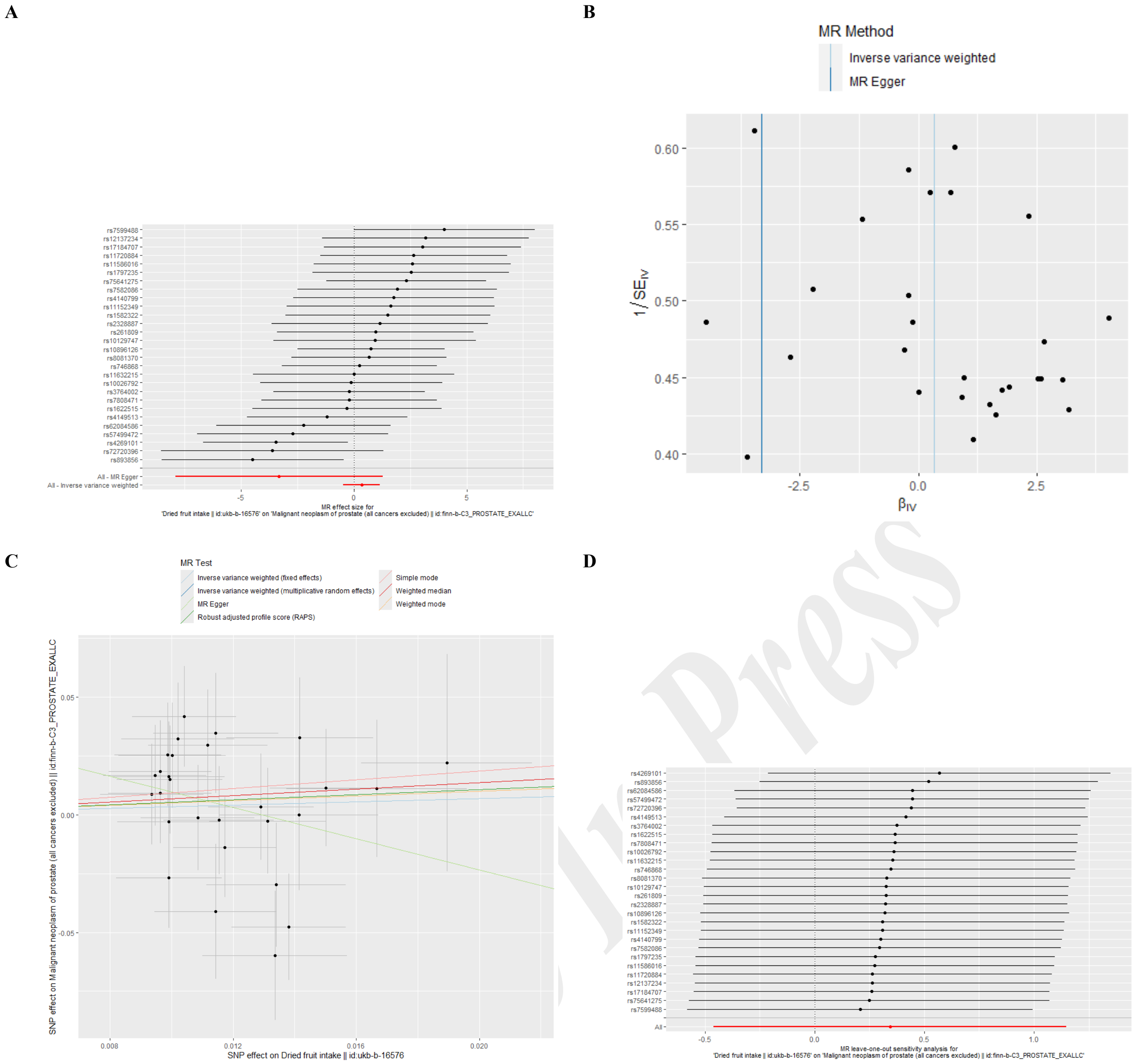
Supplementary Figure 16 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between cereal intake and PCa in MR analysis



Supplementary Figure 17 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between salad/raw vegetable intake and PCa in MR analysis



Supplementary Figure 18 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between coffee intake and PCa in MR analysis



Supplementary Figure 19 (A-D) The forest plot (A), funnel plot (B), scatter plot (C), and leave-one-out plot (D) for the association between dried fruit intake and PCa in MR analysis