**Supplementary Materials**

**Supplementary Table 1.** Details of phenotypes related to 43 instrumental variables found on the Phenoscanner website

|  |  |  |  |
| --- | --- | --- | --- |
| **SNP** | **Trait & Source** | **Gene** | **Position (hg19):** |
| rs261809 | NA |  |  |
| rs11586016 | Comparative height size at age 10 (UKBB); Qualifications: college or university degree (UKBB); Years of educational attainment (PMID = 27225129); Height (UKBB); Qualifications: none (UKBB); Sitting height (UKBB); Qualifications: A levels or as levels or equivalent (UKBB) | PTPRF | chr1:44031793 |
| rs12137234 | NA |  |  |
| rs72720396 | Morning or evening person (UKBB); Alcohol usually taken with meals (UKBB); Average weekly beer plus cider intake (UKBB); Chronotype (PMID = 27494321); Morning vs evening chronotype (PMID = 27494321) | BARHL2 | chr1:91191582 |
| rs11811826 | Qualifications: college or university degree (UKBB); Years of educational attainment (PMID = 27225129); Qualifications: other professional qualifications (UKBB) | LRRN2 | chr1:204603861 |
| rs3101339 | Body mass index (UKBB); Weight (UKBB); Leg fat mass right (UKBB); Hip circumference (UKBB); Arm fat mass left (UKBB); Leg fat percentage left (UKBB); Arm fat mass right (UKBB); Trunk fat mass (UKBB); Qualifications: college or university degree (UKBB); Body fat percentage (UKBB); Waist circumference (UKBB) | NEGR1 | chr1:72748669 |
| rs75641275 | Body mass index (UKBB); Weight (UKBB); Years of educational attainment (PMID = 27225129); Trunk fat percentage (UKBB); Leg fat percentage left (UKBB); Trunk fat mass (UKBB); Body fat percentage (UKBB); Whole body fat mass (UKBB); Waist circumference (UKBB) | DPYD | chr1:98327133 |
| rs7582086 | Height (UKBB) | RP11-444A22.1 | chr2:60231826 |
| rs7599488 | Mean corpuscular volume (PMID = 27863252); Red blood cell count (PMID = 27863252); Time spent watching television (UKBB); Red cell distribution width (PMID = 27863252); Years of educational attainment (PMID = 27225129); Qualifications: O levels or GCSEs or equivalent (UKBB); Height (UKBB) | BCL11A | chr2:60718347 |
| rs4149513 | Qualifications: college or university degree (UKBB); Years of educational attainment (PMID = 27225129); Body fat percentage (UKBB); Leg fat percentage right (UKBB); Leg fat mass right (UKBB); Leg fat percentage left (UKBB) | CHST10 | chr2:101022726 |
| rs17184707 | NA |  |  |
| rs4269101 | Arm fat percentage right (UKBB); Body fat percentage (UKBB); Trunk fat percentage (UKBB); Arm fat percentage left (UKBB) | SATB1-AS1 | chr3:18763543 |
| rs11720884 | Leg fat percentage left (UKBB); Leg fat percentage right (UKBB); Leg fat mass right (UKBB); Leg fat mass left (UKBB) | RP11-944L7.4 | chr3:43941406 |
| rs57499472 | NA |  |  |
| rs10026792 | Overall health rating (UKBB); Qualifications: college or university degree (UKBB) | ADD1 | chr4:2862190 |
| rs1648404 | NA |  |  |
| rs746868 | Height (UKBB); Intestinal malabsorption (UKBB); Self-reported malabsorption or coeliac disease (UKBB); Primary sclerosing cholangitis (PMID = 27992413); Treatment with levothyroxine sodium (UKBB); Comparative height size at age 10 (UKBB) | LTA | chr6:31540429 |
| rs9385269 | Qualifications: college or university degree (UKBB); Years of educational attainment (PMID = 27225129); Leg fat percentage right (UKBB); Body fat percentage (UKBB); Time spent using computer (UKBB); Leg fat percentage left (UKBB); Trunk fat percentage (UKBB); Leg fat mass right (UKBB); Leg fat mass left (UKBB); Qualifications: none (UKBB); Arm fat percentage left (UKBB); Years of educational attainment in females (UKBB); Body mass index (UKBB) | RP11-436D23.1 | chr6:98547979 |
| rs2328887 | Self-reported malabsorption or coeliac disease (UKBB); Primary sclerosing cholangitis (PMID = 27992413); Intestinal malabsorption (UKBB); Mean corpuscular hemoglobin (PMID = 27863252); Mean corpuscular volume (PMID = 27863252); Platelet distribution width (PMID = 27863252); Reticulocyte fraction of red cells (PMID = 27863252); Mean corpuscular hemoglobin concentration (PMID = 27863252); Reticulocyte count (PMID = 27863252); White blood cell count (PMID = 27863252) | CARMIL1 | chr6:25430149 |
| rs2533273 | Average weekly beer plus cider intake (UKBB); Mineral and other dietary supplements: fish oil (UKBB) | DPP6 | chr7:153485282 |
| rs7808471 | NA |  |  |
| rs11772627 | Body mass index (UKBB); Arm fat percentage left (UKBB); Arm fat percentage right (UKBB); Arm fat mass left (UKBB); Qualifications: college or university degree (UKBB); Hip circumference (UKBB); Whole body fat mass (UKBB); Weight (UKBB); Trunk fat mass (UKBB) | MAD1L1 | chr7:2109821 |
| rs7829800 | NA |  |  |
| rs10740991 | Leg fat mass right (UKBB); Leg fat percentage right (UKBB); Waist circumference (UKBB); Body mass index (UKBB); Body fat percentage (UKBB); Weight (UKBB); Trunk fat percentage (UKBB); Arm predicted mass right (UKBB); Arm fat mass left (UKBB); Hip circumference (UKBB) | DNAJC1 | chr10:22058137 |
| rs7916868 | Body mass index (UKBB); Mean platelet volume (PMID = 27863252); Height (UKBB); Platelet count (PMID = 27863252); Platelet distribution width (PMID = 27863252); Fibrinogen levels (PMID = 26561523); Years of educational attainment (PMID = 27225129); Age completed full time education (UKBB) | JMJD1C | chr10:64988931 |
| rs893856 | NA |  |  |
| rs10896126 | NA |  |  |
| rs11037497 | Body mass index (UKBB); Whole body fat mass (UKBB); Comparative height size at age 10 (UKBB) | RP11-472I20.4 | chr11:43622423 |
| rs1622515 | Qualifications: college or university degree (UKBB); Qualifications: A levels or as levels or equivalent (UKBB); Qualifications: none (UKBB | NA | chr11:95523433 |
| rs3764002 | Leg fat percentage left (UKBB); Leg fat percentage right (UKBB); Sitting height (UKBB); Body mass index (UKBB); Body fat percentage (UKBB); Impedance of leg left (UKBB); Trunk fat percentage (UKBB); Arm fat percentage right (UKBB); Trunk fat mass (UKBB); Waist circumference (UKBB); Whole body fat mass (UKBB) | WSCD2 | chr12:108618630 |
| rs4140799 | Neuroticism score (UKBB); Sensitivity or hurt feelings (UKBB) | SIPA1L1 | chr14:72170969 |
| rs34162196 | NA |  |  |
| rs10129747 | NA |  |  |
| rs1797235 | NA |  |  |
| rs11632215 | NA |  |  |
| rs862227 | NA |  |  |
| rs1582322 | NA |  |  |
| rs62084586 | Monocyte percentage of white cells (PMID = 27863252); Granulocyte percentage of myeloid white cells (PMID = 27863252) | SUPT4H1 | chr17:56419228 |
| rs8081370 | NA |  |  |
| rs4800488 | Body mass index (UKBB); Weight (UKBB); Whole body fat mass (UKBB); Trunk fat mass (UKBB); Arm predicted mass left (UKBB); Waist circumference (UKBB); Hip circumference (UKBB); Leg predicted mass left (UKBB); Body fat percentage (UKBB); Height (UKBB) | NPC1 | chr18:21117571 |
| rs17175518 | Body mass index (UKBB); Whole body water mass (UKBB); Leg predicted mass left (UKBB); Trunk predicted mass (UKBB); Arm predicted mass left (UKBB); Weight (UKBB); Impedance of whole body (UKBB); Hip circumference (UKBB); Whole body fat mass (UKBB) | RP11-795H16.2 | chr18:57850583 |
| rs11152349 | NA |  |  |
| rs429358 | Body mass index (UKBB); Weight (UKBB); Trunk fat percentage (UKBB); Trunk fat mass (UKBB); Arm fat mass left (UKBB); Arm fat mass right (UKBB); Whole body fat mass (UKBB); Body fat percentage (UKBB); Leg fat mass right (UKBB); Leg fat percentage right (UKBB); Leg fat percentage left (UKBB) | APOE | chr19:45411941 |

UKBB: UK Biobank.

**Supplementary Table 2.** Characteristics of SNPs extracted from exposure (dried fruit intake) GWAS statistical summary data.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **SNP** | **Chromosome: Position** | **EA** | **OA** | **EAF** | ***F*-Statistic** | **Association with exposure** | |
| **Beta (SE)** | ***P*-value** |
| rs261809 | 1:241054465 | G | A | 0.5406 | 19.4224 | -0.0096(0.0017) | 9.80E-09 |
| rs11586016 | 1:44031793 | C | G | 0.3710 | 19.2087 | 0.0099(0.0017) | 1.10E-08 |
| rs12137234 | 1:72270797 | T | C | 0.3038 | 18.5802 | 0.0102(0.0018) | 2.80E-08 |
| rs72720396 | 1:91191582 | G | A | 0.2292 | 19.4555 | 0.0114(0.0020) | 8.70E-09 |
| rs11811826 | 1:204603861 | A | T | 0.2242 | 25.6372 | 0.0132(0.0020) | 4.40E-11 |
| rs3101339 | 1:72748669 | C | A | 0.6033 | 41.0534 | 0.0143(0.0017) | 6.20E-17 |
| rs75641275 | 1:98327133 | C | A | 0.1434 | 20.7769 | -0.0142(0.0024) | 2.90E-09 |
| rs7582086 | 2:60231826 | T | G | 0.4683 | 19.4714 | -0.0096(0.0017) | 8.80E-09 |
| rs7599488 | 2:60718347 | T | C | 0.4264 | 22.3821 | -0.0104(0.0017) | 6.70E-10 |
| rs4149513 | 2:101022726 | A | G | 0.4935 | 29.0129 | 0.0117(0.0017) | 2.20E-12 |
| rs17184707 | 2:166183577 | T | C | 0.2128 | 18.4883 | -0.0114(0.0020) | 2.10E-08 |
| rs4269101 | 3:18763543 | G | T | 0.7189 | 32.5084 | -0.0138(0.0019) | 1.10E-13 |
| rs11720884 | 3:43941406 | G | A | 0.2501 | 19.7760 | 0.0112(0.0019) | 7.60E-09 |
| rs57499472 | 3:147239337 | C | T | 0.4041 | 19.9591 | 0.0099(0.0017) | 8.10E-09 |
| rs10026792 | 4:2862190 | A | G | 0.2904 | 20.4509 | 0.0108(0.0018) | 3.90E-09 |
| rs1648404 | 4:37175523 | T | C | 0.4761 | 18.6549 | 0.0094(0.0017) | 1.80E-08 |
| rs746868 | 6:31540429 | G | C | 0.6147 | 33.2782 | -0.0129(0.0017) | 5.20E-14 |
| rs9385269 | 6:98547979 | T | C | 0.5246 | 30.6365 | 0.0121(0.0017) | 7.20E-13 |
| rs2328887 | 6:25430149 | C | T | 0.8995 | 27.3877 | 0.0189(0.0028) | 8.80E-12 |
| rs2533273 | 7:153485282 | A | C | 0.4845 | 20.5521 | -0.0099(0.0017) | 3.90E-09 |
| rs7808471 | 7:132716502 | C | T | 0.3221 | 24.5149 | -0.0115(0.0018) | 1.10E-10 |
| rs11772627 | 7:2109821 | C | G | 0.1820 | 42.2190 | 0.0183(0.0022) | 3.00E-17 |
| rs7829800 | 8:144258705 | G | A | 0.6710 | 20.3205 | -0.0104(0.0018) | 5.10E-09 |
| rs10740991 | 10:22058137 | C | G | 0.7176 | 47.9013 | 0.0167(0.0019) | 2.00E-19 |
| rs7916868 | 10:64988931 | T | A | 0.5035 | 19.4648 | 0.0096(0.0017) | 9.10E-09 |
| rs893856 | 10:126723567 | A | G | 0.1490 | 19.0933 | -0.0134(0.0023) | 1.30E-08 |
| rs10896126 | 11:66292908 | G | A | 0.3036 | 40.1780 | -0.0150(0.0018) | 1.60E-16 |
| rs11037497 | 11:43622423 | C | G | 0.4462 | 22.7178 | 0.0104(0.0017) | 5.70E-10 |
| rs1622515 | 11:95523433 | G | A | 0.4847 | 20.7219 | 0.0099(0.0017) | 2.90E-09 |
| rs3764002 | 12:108618630 | T | C | 0.2614 | 28.0431 | 0.0131(0.0019) | 5.10E-12 |
| rs4140799 | 14:72170969 | A | G | 0.5319 | 18.7828 | 0.0095(0.0017) | 1.80E-08 |
| rs34162196 | 14:22038125 | T | C | 0.1010 | 38.3066 | -0.0224(0.0028) | 7.10E-16 |
| rs10129747 | 14:77433198 | G | A | 0.5303 | 18.4045 | 0.0094(0.0017) | 2.60E-08 |
| rs1797235 | 15:47821612 | C | G | 0.3746 | 19.8446 | -0.0100(0.0017) | 8.90E-09 |
| rs11632215 | 15:45319982 | C | A | 0.1202 | 17.8421 | -0.0141(0.0026) | 4.40E-08 |
| rs862227 | 16:73602926 | G | A | 0.4583 | 17.5896 | -0.0092(0.0017) | 4.30E-08 |
| rs1582322 | 16:52105988 | G | A | 0.6048 | 19.9352 | 0.0099(0.0017) | 6.80E-09 |
| rs62084586 | 17:56419228 | C | T | 0.1657 | 20.9259 | 0.0134(0.0023) | 3.20E-09 |
| rs8081370 | 17:1373612 | T | C | 0.9102 | 19.1463 | -0.0167(0.0029) | 1.40E-08 |
| rs4800488 | 18:21117571 | A | C | 0.4899 | 30.2736 | 0.0120(0.0017) | 7.70E-13 |
| rs17175518 | 18:57850583 | A | C | 0.2328 | 19.9107 | 0.0115(0.002) | 5.90E-09 |
| rs11152349 | 18:60233646 | A | G | 0.3029 | 17.4989 | 0.0099(0.0018) | 4.90E-08 |
| rs429358 | 19:45411941 | C | T | 0.1542 | 43.7683 | 0.0199(0.0023) | 6.70E-18 |

SNP: single nucleotide polymorphism; EA: effect Allele; OA: other Allele; EFA: effect allele frequency; SE: standard error.

**Supplementary figure legend**

Figure S1.Scatter plot of SNPs associated with dried fruit intake and risk on Type 2 diabetes without complications.

Figure S2.Scatter plot of SNPs associated with dried fruit intake and risk on Type 2 diabetes with neurological complications.

Figure S3.Scatter plot of SNPs associated with dried fruit intake and risk on Type 2 diabetes with renal complications.

Figure S4.Scatter plot of SNPs associated with dried fruit intake and risk on Type 2 diabetes with ophthalmic complications.

Figure S5.Scatter plot of SNPs associated with dried fruit intake and risk on Type 2 diabetes with peripheral circulatory complications.

Figure S6.Scatter plot of SNPs associated with dried fruit intake and risk on Type 2 diabetes with ketoacidosis.

Figure S7.Scatter plot of SNPs associated with dried fruit intake and risk on Fasting insulin.

Figure S8.Scatter plot of SNPs associated with dried fruit intake and risk on Fasting glucose.

Figure S9.Scatter plot of SNPs associated with dried fruit intake and risk on Two-hour glucose.

Figure S10.Scatter plot of SNPs associated with dried fruit intake and risk on HbA1c.

Figure S11. Funnel plot of the relationship between the causal effect of dried fruit intake on Type 2 diabetes without complications.

Figure S12. Funnel plot of the relationship between the causal effect of dried fruit intake on Type 2 diabetes with neurological complications.

Figure S13. Funnel plot of the relationship between the causal effect of dried fruit intake on Type 2 diabetes with renal complications.

Figure S14. Funnel plot of the relationship between the causal effect of dried fruit intake on Type 2 diabetes with ophthalmic complications.

Figure S15. Funnel plot of the relationship between the causal effect of dried fruit intake on Fasting insulin.

Figure S16. Leave-one-out analysis result of SNPs associated with dried fruit intake and risk on Type 2 diabetes without complications

Figure S17. Leave-one-out analysis result of SNPs associated with dried fruit intake and risk on Fasting insulin.

Figure S1

1-1

Figure S2

1-2

Figure S3

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Figure S4

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Figure S5

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Figure S6

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Figure S7

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Figure S8

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Figure S9

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Figure S10

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Figure S11

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Figure S12

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Figure S13

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Figure S14

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Figure S15

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Figure S16

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Figure S17

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