**Supplementary Material**

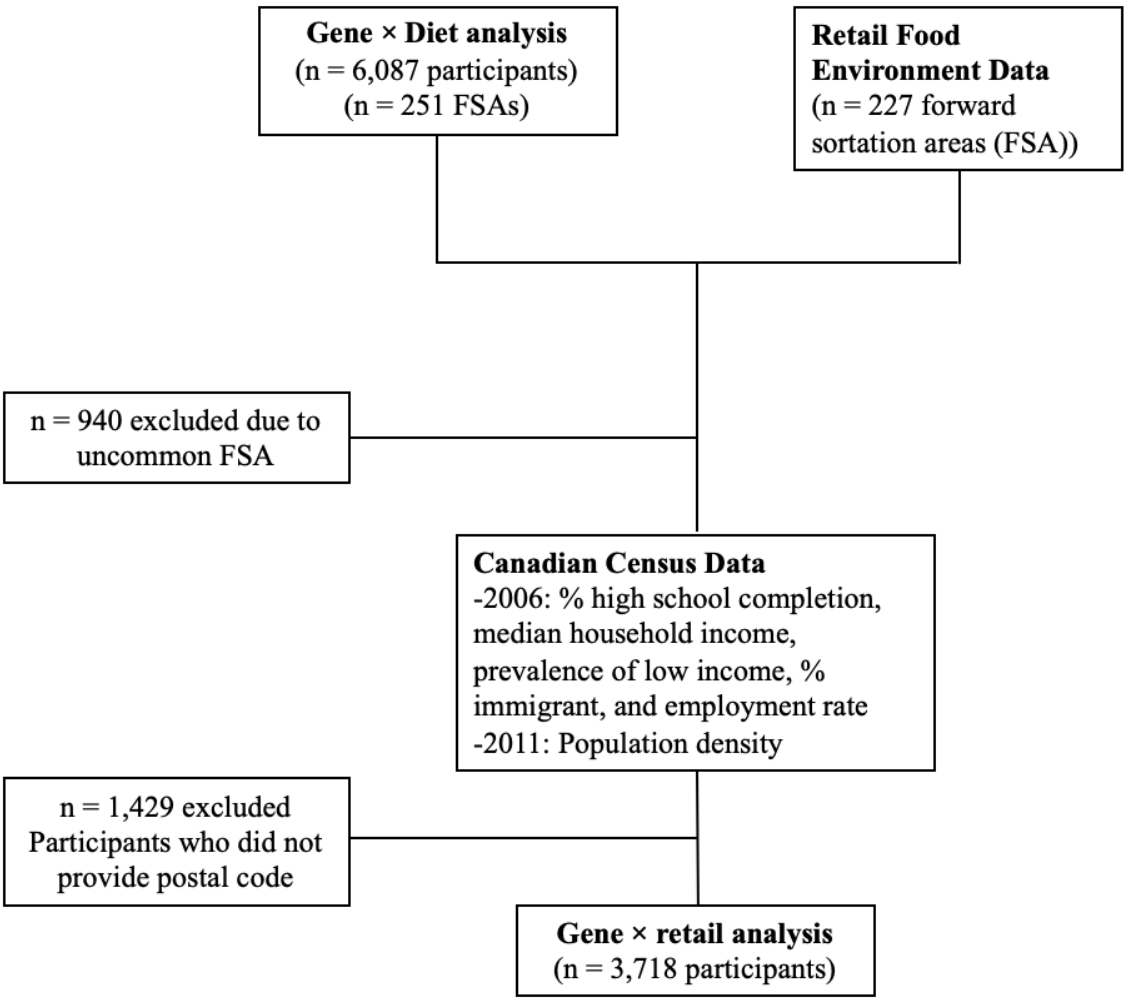


**Figure S1:** Participant flow chart

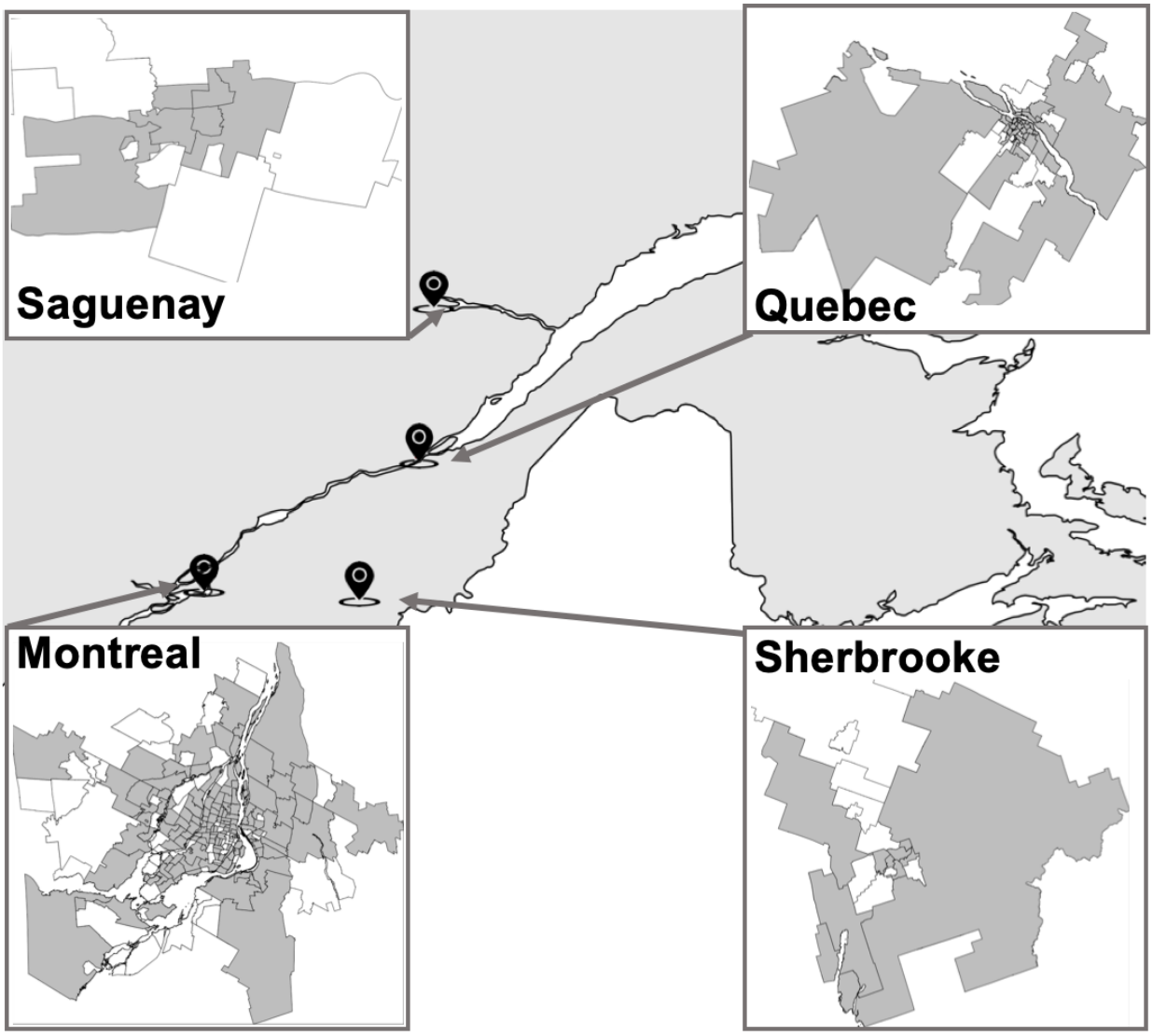


**Figure S2:** CARTaGENE FSAs (shaded in grey for each regions) represented in Quebec retail food environment data.

**Supplemental Table S1:** Genetic variants associated with body mass index (1)

| SNP ID | SNP | Chr | Position | Nearest genes | BMI-increasing allele | Effect size |
|---|---|---|---|---|---|---|
| 77 loci reaching genome-wide significance in European-descent individuals | | | | | | |
| 1 | rs657452 | 1 | 49,362,434 | *AGBL4* | A | 0.0227 |
| 2 | rs11583200 | 1 | 50,332,407 | *ELAVL4* | C | 0.0177 |
| 3 | rs12566985 | 1 | 74,774,781 | *FPGT* | G | 0.0242 |
| 4 | rs12401738 | 1 | 78,219,349 | *FUBP1* | A | 0.0211 |
| 5 | rs17024393 | 1 | 109,956,211 | *GNAT2* | C | 0.0658 |
| 6 | rs2820292 | 1 | 200,050,910 | *NAV1* | C | 0.0195 |
| 7 | rs3101336 | 1 | 72,523,773 | *NEGR1* | C | 0.0334 |
| 8 | rs11165643 | 1 | 96,696,685 | *PTBP2* | T | 0.0218 |
| 9 | rs543874 | 1 | 176,156,103 | *SEC16B* | G | 0.0482 |
| 10 | rs10182181 | 2 | 25,003,800 | *ADCY3* | G | 0.0307 |
| 11 | rs11688816 | 2 | 62,906,552 | *EHBP1* | G | 0.0172 |
| 12 | rs7599312 | 2 | 213,121,476 | *ERBB4* | G | 0.0220 |
| 13 | rs11126666 | 2 | 26,782,315 | *KCNK3* | A | 0.0207 |
| 14 | rs2121279 | 2 | 142,759,755 | *LRP1B* | T | 0.0245 |
| 15 | rs13021737 | 2 | 622,348 | *TMEM18* | G | 0.0601 |
| 16 | rs1528435 | 2 | 181,259,207 | *UBE2E3* | T | 0.0178 |
| 17 | rs13078960 | 3 | 85,890,280 | *CADM2* | G | 0.0297 |
| 18 | rs1516725 | 3 | 187,306,698 | *ETV5* | C | 0.0451 |
| 19 | rs2365389 | 3 | 61,211,502 | *FHIT* | C | 0.0200 |
| 20 | rs3849570 | 3 | 81,874,802 | *GBE1* | A | 0.0188 |
| 21 | rs6804842 | 3 | 25,081,441 | *RARB* | G | 0.0185 |
| 22 | rs16851483 | 3 | 142,758,126 | *RASA2* | T | 0.0483 |
| 23 | rs10938397 | 4 | 44,877,284 | *GNPDA2* | G | 0.0402 |
| 24 | rs11727676 | 4 | 145,878,514 | *HHIP* | T | 0.0358 |
| 25 | rs17001654 | 4 | 77,348,592 | *SCARB2* | G | 0.0306 |
| 26 | rs13107325 | 4 | 103,407,732 | *SLC39A8* | T | 0.0477 |
| 27 | rs2112347 | 5 | 75,050,998 | *POC5* | T | 0.0261 |
| 28 | rs205262 | 6 | 34,671,142 | *C6orf106* | G | 0.0221 |
| 29 | rs9400239 | 6 | 109,084,356 | *FOXO3* | C | 0.0188 |
| 30 | rs13191362 | 6 | 162,953,340 | *PARK2* | A | 0.0277 |
| 31 | rs2033529 | 6 | 40,456,631 | *TDRG1* | G | 0.0190 |
| 32 | rs2207139 | 6 | 50,953,449 | *TFAP2B* | G | 0.0447 |
| 33 | rs1167827 | 7 | 75,001,105 | *HIP1* | G | 0.0202 |
| 34 | rs17405819 | 8 | 76,969,139 | *HNF4G* | T | 0.0224 |
| 35 | rs2033732 | 8 | 85,242,264 | *RALYL* | C | 0.0192 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 36 | rs4740619 | 9 | 15,624,326 | *C9orf93* | T | 0.0179 |
| 37 | rs6477694 | 9 | 110,972,163 | *EPB41L4B* | C | 0.0174 |
| 38 | rs10968576 | 9 | 28,404,339 | *LINGO2* | G | 0.0249 |
| 39 | rs10733682 | 9 | 128,500,735 | *LMX1B* | A | 0.0174 |
| 40 | rs1928295 | 9 | 119,418,304 | *TLR4* | T | 0.0188 |
| 41 | rs7899106 | 10 | 87,400,884 | *GRID1* | G | 0.0395 |
| 42 | rs17094222 | 10 | 102,385,430 | *HIF1AN* | C | 0.0249 |
| 43 | rs11191560 | 10 | 104,859,028 | *NT5C2* | C | 0.0308 |
| 44 | rs7903146 | 10 | 114,748,339 | *TCF7L2* | C | 0.0234 |
| 45 | rs11030104 | 11 | 27,641,093 | *BDNF* | A | 0.0414 |
| 46 | rs12286929 | 11 | 114,527,614 | *CADM1* | G | 0.0217 |
| 47 | rs2176598 | 11 | 43,820,854 | *HSD17B12* | T | 0.0198 |
| 48 | rs3817334 | 11 | 47,607,569 | *MTCH2* | T | 0.0262 |
| 49 | rs4256980 | 11 | 8,630,515 | *TRIM66* | G | 0.0209 |
| 50 | rs7138803 | 12 | 48,533,735 | *BCDIN3D* | A | 0.0315 |
| 51 | rs11057405 | 12 | 121,347,850 | *CLIP1* | G | 0.0307 |
| 52 | rs12016871 | 13 | 26,915,782 | *MTIF3* | T | 0.0298 |
| 53 | rs12429545 | 13 | 53,000,207 | *OLFM4* | A | 0.0334 |
| 54 | rs7141420 | 14 | 78,969,207 | *NRXN3* | T | 0.0235 |
| 55 | rs11847697 | 14 | 29,584,863 | *PRKD1* | T | 0.0492 |
| 56 | rs12885454 | 14 | 28,806,589 | *PRKD1* | C | 0.0207 |
| 57 | rs10132280 | 14 | 24,998,019 | *STXBP6* | C | 0.0230 |
| 58 | rs3736485 | 15 | 49,535,902 | *DMXL2* | A | 0.0176 |
| 59 | rs16951275 | 15 | 65,864,222 | *MAP2K5* | T | 0.0311 |
| 60 | rs3888190 | 16 | 28,796,987 | *ATP2A1* | A | 0.0309 |
| 61 | rs1558902 | 16 | 52,361,075 | *FTO* | A | 0.0818 |
| 62 | rs12446632 | 16 | 19,842,890 | *GPRC5B* | G | 0.0403 |
| 63 | rs9925964 | 16 | 31,037,396 | *KAT8* | A | 0.0192 |
| 64 | rs758747 | 16 | 3,567,359 | *NLRC3* | T | 0.0225 |
| 65 | rs2650492 | 16 | 28,240,912 | *SBK1* | A | 0.0207 |
| 66 | rs1000940 | 17 | 5,223,976 | *RABEP1* | G | 0.0192 |
| 67 | rs12940622 | 17 | 76,230,166 | *RPTOR* | G | 0.0182 |
| 68 | rs1808579 | 18 | 19,358,886 | *C18orf8* | C | 0.0167 |
| 69 | rs7243357 | 18 | 55,034,299 | *GRP* | T | 0.0217 |
| 70 | rs6567160 | 18 | 55,980,115 | *MC4R* | C | 0.0556 |
| 71 | rs29941 | 19 | 39,001,372 | *KCTD15* | G | 0.0182 |
| 72 | rs17724992 | 19 | 18,315,825 | *PGPEP1* | A | 0.0194 |
| 73 | rs2287019 | 19 | 50,894,012 | *QPCTL* | C | 0.0360 |
| 74 | rs2075650 | 19 | 50,087,459 | *TOMM40* | A | 0.0258 |
| 75 | rs3810291 | 19 | 52,260,843 | *ZC3H4* | A | 0.0283 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 76 | rs1016287 | 2 | 59,159,129 | *LINC01122* | T | 0.0229 |
| 77 | rs2245368 | 7 | 76,446,079 | *DTX2P1* | C | 0.0317 |
| 20 loci reaching genome-wide significance with inclusion of non-European-decent individuals | | | | | | |
| 78 | rs977747 | 1 | 47,457,264 | *TAL1* | T | 0.0167 |
| 79 | rs17203016 | 2 | 207,963,763 | *CREB1* | G | 0.0210 |
| 80 | rs1460676 | 2 | 164,275,935 | *FIGN* | C | 0.0197 |
| 81 | rs2176040 | 2 | 226,801,046 | *LOC646736* | A | 0.0141 |
| 82 | rs492400 | 2 | 219,057,996 | *USP37* | C | 0.0158 |
| 83 | rs7715256 | 5 | 153,518,086 | *GALNT10* | G | 0.0163 |
| 84 | rs13201877 | 6 | 137,717,234 | *IFNGR1* | G | 0.0233 |
| 85 | rs9374842 | 6 | 120,227,364 | *LOC285762* | T | 0.0187 |
| 86 | rs6465468 | 7 | 95,007,450 | *ASB4* | T | 0.0166 |
| 87 | rs9641123 | 7 | 93,035,668 | *CALCR* | C | 0.0191 |
| 88 | rs16907751 | 8 | 81,538,012 | *ZBTB10* | C | 0.0350 |
| 89 | rs1441264 | 13 | 78,478,920 | *MIR548A2* | A | 0.0175 |
| 90 | rs9540493 | 13 | 65,103,705 | *MIR548X2* | A | 0.0172 |
| 91 | rs7164727 | 15 | 70,881,044 | *LOC100287559* | T | 0.0180 |
| 92 | rs2080454 | 16 | 47,620,091 | *CBLN1* | C | 0.0168 |
| 93 | rs4787491 | 16 | 29,922,838 | *INO80E* | G | 0.0159 |
| 94 | rs9914578 | 17 | 1,951,886 | *SMG6* | G | 0.0201 |
| 95 | rs7239883 | 18 | 38,401,669 | *LOC284260* | G | 0.0164 |
| 96 | rs6091540 | 20 | 50,521,269 | *ZFP64* | C | 0.0188 |
| 97 | rs2836754 | 21 | 39,213,610 | *ETS2* | C | 0.0164 |

SNP, single nuclear polymorphism; Chr, chromosome

**Table S2:** Sensitivity analysis (excluding total energy intake from the model) for genetic risk score and diet quality score main and interaction effects on waist circumference, body mass index, and body fat percent

| | **Waist circumference (cm)** | | | **Body Mass Index (kg/m2)** | | | **Percentage of body fat** | | |
|---|---|---|---|---|---|---|---|---|---|
| | Estimate | 95% CI | p-value | Estimate | 95% CI | p-value | Estimate | 95% CI | p-value |
| Overall (*n* = 6,087) | | | | | | | | | |
| PRS | 1.4 | (1.0, 1.7) | <.0001 | 0.6 | (0.5, 0.8) | <.0001 | 0.6 | (0.5, 0.8) | <.0001 |
| HEI-C | 0.2 | (-0.2, 0.6) | 0.33 | 0.2 | (0.0, 0.3) | 0.06 | 0.1 | (-0.1, 0.3) | 0.31 |
| PRS×HEI-C | -0.4 | (-0.8, -0.1) | 0.01 | -0.1 | (-0.3, 0.0) | 0.05 | -0.2 | (-0.3, 0.0) | 0.05 |
| *PRS in quintiles* | | | | | | | | | |
| PRS quintile 2 | 1.8 | (0.8, 2.8) | 0.01 | 0.7 | (0.3, 1.1) | 0.01 | 1.0 | (0.4, 1.5) | 0.01 |
| PRS quintile 3 | 2.6 | (1.4, 3.6) | <.0001 | 1.2 | (0.8, 1.6) | <.0001 | 1.5 | (1.0, 2.1) | <.0001 |
| PRS quintile 4 | 3.1 | (2.0, 4.1) | <.0001 | 1.3 | (0.9, 1.7) | <.0001 | 1.6 | (1.0, 2.1) | <.0001 |
| PRS quintile 5 | 3.9 | (2.9, 4.9) | <.0001 | 1.8 | (1.4, 2.3) | <.0001 | 1.8 | (1.3, 2.4) | <.0001 |
| HEI-C | 0.4 | (-0.4, 1.1) | 0.33 | 0.1 | (-0.3, 0.5) | 0.21 | 0.1 | (-0.3, 0.5) | 0.51 |
| PRS quintile 2×HEI-C | 0.5 | (-0.5, 1.5) | 0.32 | 0.1 | (-0.3, 0.5) | 0.51 | 0.2 | (-0.3, 0.8) | 0.43 |
| PRS quintile 3×HEI-C | -0.5 | (-1.6, 0.5) | 0.34 | -0.1 | (-0.5, 0.3) | 0.62 | -0.1 | (-0.7, 0.5) | 0.74 |
| PRS quintile 4×HEI-C | -0.0 | (-1.1, 1.0) | 0.98 | 0.1 | (-0.3, 0.5) | 0.62 | 0.3 | (-0.3, 0.8) | 0.31 |
| PRS quintile 5×HEI-C | -0.9 | (-1.2, 0.1) | 0.08 | -0.3 | (-0.7, 0.1) | 0.11 | -0.5 | (-1.0, 0.0) | 0.07 |
| Males (*n* = 2,780) | | | | | | | | | |
| PRS | 1.5 | (1.1, 2.0) | <.0001 | 0.6 | (0.5, 0.8) | <.0001 | 0.6 | (0.4, 0.8) | <.0001 |
| HEI-C | 0.2 | (-0.3, 0.8) | 0.41 | 0.2 | (0.0, 0.3) | 0.11 | 0.1 | (-0.2, 0.4) | 0.57 |
| PRS×HEI-C | -0.7 | (-1.2, -0.3) | 0.01 | -0.2 | (-0.4, -0.1) | 0.01 | -0.3 | (-0.5, -0.1) | 0.01 |
| *PRS in quintiles* | | | | | | | | | |
| PRS quintile 2 | 1.9 | (0.5, 3.4) | 0.01 | 0.6 | (0.1, 1.1) | 0.02 | 0.8 | (0.1, 1.5) | 0.03 |
| PRS quintile 3 | 3.3 | (1.8, 4.7) | <.0001 | 1.2 | (0.7, 1.8) | <.0001 | 1.5 | (0.7, 2.2) | <.0001 |
| PRS quintile 4 | 3.1 | (1.6, 4.5) | <.0001 | 1.3 | (0.8, 1.8) | <.0001 | 1.2 | (0.4, 1.9) | <0.01 |
| PRS quintile 5 | 4.5 | (3.0, 5.9) | <.0001 | 1.8 | (1.3, 2.3) | <.0001 | 1.8 | (1.0, 2.5) | <.0001 |
| HEI-C | 0.9 | (-0.2, 1.9) | 0.11 | 0.3 | (-0.1, 0.7) | 0.10 | 0.3 | (-0.2, 0.9) | 0.25 |
| PRS quintile 2×HEI-C | 0.2 | (-1.3, 1.7) | 0.80 | 0.1 | (-0.4, 0.6) | 0.76 | 0.1 | (-0.7, 0.8) | 0.81 |
| PRS quintile 3×HEI-C | -0.9 | (-2.2, 0.7) | 0.29 | -0.2 | (-0.7, 0.3) | 0.46 | -0.3 | (-1.0, 0.5) | 0.46 |
| PRS quintile 4×HEI-C | -1.2 | (-2.7, 0.3) | 0.11 | -0.2 | (-0.7, 0.3) | 0.49 | -0.3 | (-1.1, 0.4) | 0.41 |
| PRS quintile 5×HEI-C | -1.4 | (-2.9, 0.0) | 0.05 | -0.6 | (-1.1, -0.0) | 0.04 | -0.7 | (-1.4, 0.1) | 0.07 |
| Females (*n* = 3,307) | | | | | | | | | |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| PRS | 1.2 | (0.7, 1.6) | <.0001 | 0.6 | (0.5, 0.8) | <.0001 | 0.7 | (0.4, 0.9) | <.0001 |
| HEI-C | 0.2 | (-0.3, 0.8) | 0.40 | 0.2 | (-0.1, 0.4) | 0.14 | 0.2 | (-0.1, 0.5) | 0.29 |
| PRS×HEI-C | -0.2 | (-0.6, 0.3) | 0.52 | -0.0 | (-0.2, 0.1) | 0.65 | -0.1 | (-0.3, 0.2) | 0.57 |
| *PRS in quintiles* | | | | | | | | | |
| PRS quintile 2 | 1.5 | (0.0, 2.9) | 0.044 | 0.7 | (0.1, 1.3) | 0.016 | 1.0 | (0.2, 1.8) | 0.011 |
| PRS quintile 3 | 2.2 | (0.7, 3.6) | <.001 | 1.2 | (0.6, 1.8) | <.001 | 1.6 | (0.8, 2.4) | <.001 |
| PRS quintile 4 | 2.9 | (1.5, 4.4) | <.0001 | 1.3 | (0.7, 1.9) | <.0001 | 1.9 | (1.1, 2.6) | <.0001 |
| PRS quintile 5 | 3.3 | (1.9, 4.7) | <.0001 | 1.9 | (1.3, 2.4) | <.0001 | 1.8 | (1.0, 2.6) | <.0001 |
| HEI-C | -0.1 | (-1.2, 1.0) | 0.84 | 0.1 | (-0.3, 0.5) | 0.65 | 0.0 | (-0.6, 0.6) | 0.95 |
| PRS quintile 2×HEI-C | 1.0 | (-0.4, 2.4) | 0.18 | 0.2 | (-0.4, 0.7) | 0.61 | 0.3 | (-0.5, 1.1) | 0.47 |
| PRS quintile 3×HEI-C | 0.1 | (-1.4, 1.6) | 0.95 | 0.1 | (-0.6, 0.7) | 0.88 | 0.1 | (-0.7, 1.0) | 0.73 |
| PRS quintile 4×HEI-C | 0.9 | (-0.6, 2.4) | 0.22 | 0.3 | (-0.3, 0.9) | 0.30 | 0.7 | (-0.1, 1.5) | 0.08 |
| PRS quintile 5×HEI-C | -0.2 | (-1.6, 1.2) | 0.77 | -0.2 | (-0.8, 0.4) | 0.60 | -0.3 | (-1.1, 0.4) | 0.39 |

**Table S3:** Participant characteristics of retail analysis sample (*n* = 3,718)

| Characteristic | Descriptive statistics[a] |
|---|---|
| Age, years | 55(8) |
| Female, n (%) | 1992 (53.58) |
| Household Income, (n (%)) | |
| <CAD 25,000 | 288 (7.75) |
| CAD 25,000-50,000 | 814 (21.89) |
| CAD 50,000-75,000 | 823 (22.14) |
| CAD 75,000-150,000 | 1258 (33.84) |
| >CAD 150,000 | 406 (10.92) |
| Missing | 129 (3.47) |
| Education, (n (%)) | |
| High school or less | 789 (21.22) |
| College | 1195 (32.14) |
| University or higher | 1726 (46.42) |
| Missing | 8 (0.22) |
| Language (French), n (%) | 3569 (95.99) |
| Ethnicity (Caucasian), n(%) | 3536 (96.30) |
| Physical activity level | 1.48 (0.36) |
| Smoking status, n (%) | |
| Never | 1522 (40.94) |
| Daily | 422 (11.35) |
| Occasionally | 127 (3.42) |
| Past | 1641 (44.14) |
| Missing | 6 (0.16) |
| Marital status, n (%) | |
| Married | 2480 (66.70) |
| Divorced | 712 (19.15) |
| Single | 520 (13.99) |
| Missing | 6 (0.16) |
| Season, n (%) | |
| October - March | 2183 (58.71) |
| April - September | 1535 (41.29) |
| Waist Circumference (cm) | 93.7 (14.6) |
| BMI | 27.6 (5.4) |
| Percentage of body fat | 30.9 (8.7) |
| Genetic risk score | 87.31 (6.34) |
| Energy intake (kcal/day) | 1717(941) |
| Alcohol consumption (kcal/day) | 83 (182) |
| Reporter status, n (%) | |
| Under reporter | 1705 (45.86) |
| Plausible reporter | 1808 (48.63) |
| Over reporter | 205 (5.51) |
| Diet quality scores (min.-max.) | |
| HEI-C 2010 score (0-100) | 57.6 (13.2) |
| Adequacy sub-score (0-60) | 32.4(12.0) |

| | |
|---|---|
| Moderate sub-score (0-40) | 25.2 (5.2) |
| Retail measurement (min.-max.) | |
| Display measure (0-42.50) | 1.16 (4.47) |
| Discount measure (0-6.53) | 1.96 (1.41) |
| Regular price measure (0.12-10.17) | 1.55 (2.05) |
| Variety measure (0-3.37) | 0.93 (0.99) |

[a]Values are mean (standard deviation) unless otherwise indicated

**Table S4:** Mean and standard deviation of HEI-C score, waist circumference and BMI of PRS quintile in retail analysis sample

| **PRS quintile** | **1** | **2** | **3** | **4** | **5** | **p-value for trend** |
|---|---|---|---|---|---|---|
| Combined, *n* = 3,718 | | | | | | |
| HEI-C | 58.1 | 57.0 | 57.3 | 57.4 | 57.2 | 0.52 |
| Waist circumference (cm) | 91.8 | 93.5 | 94.4 | 94.6 | 95.8 | <.0001 |
| BMI (kg/m$^2$) | 26.6 | 27.3 | 27.7 | 28.0 | 28.6 | <.0001 |
| Percentage of body fat | 29.3 | 30.2 | 30.7 | 30.8 | 31.2 | <.0001 |
| Male, *n* = 1,726 | | | | | | |
| HEI-C | 55.0 | 54.6 | 54.5 | 56.1 | 53.9 | 0.29 |
| Waist circumference (cm) | 97.1 | 99.2 | 99.9 | 99.8 | 101.3 | <.001 |
| BMI (kg/m$^2$) | 27.1 | 27.7 | 28.3 | 28.5 | 28.8 | <.0001 |
| Percentage of body fat | 24.3 | 25.2 | 25.7 | 25.5 | 26.1 | 0.006 |
| Female, *n* = 1,992 | | | | | | |
| HEI-C | 61.1 | 59.5 | 60.0 | 59.0 | 60.4 | 0.14 |
| Waist circumference (cm) | 86.5 | 87.8 | 88.8 | 89.7 | 90.3 | <.001 |
| BMI (kg/m$^2$) | 26.1 | 26.9 | 27.2 | 27.5 | 28.2 | <.0001 |
| Percentage of body fat | 34.2 | 35.2 | 35.8 | 36.2 | 36.2 | <.001 |

Mean values are adjusted for sex (combined sample only) and age.

HEI-C, Canadian adaptation of the Healthy Eating Index 2010; BMI, Body Mass Index; PRS, polygenic risk score for obesity

**Table S5:** Mean of HEI-C individual components by PRS quintile in retail analysis sample

| PRS quintile | 1 | 2 | 3 | 4 | 5 | p-value for trend |
|---|---|---|---|---|---|---|
| Combined, *n* = 3,718 | | | | | | |
| Fruit and vegetables, servings/day | 7.2 | 7.0 | 7.1 | 6.9 | 6.7 | 0.32 |
| Whole fruit, servings/day | 2.3 | 2.0 | 2.2 | 2.2 | 2.0 | 0.01 |
| Greens and beans, servings/day | 1.0 | 1.1 | 1.0 | 1.0 | 1.0 | 0.30 |
| Whole grains, servings/day | 0.6 | 0.6 | 0.6 | 0.6 | 0.6 | 0.62 |
| Dairy, servings/day | 1.8 | 1.6 | 1.6 | 1.7 | 1.6 | 0.23 |
| Total protein foods, servings/day | 1.8 | 1.7 | 1.7 | 1.7 | 1.7 | 0.77 |
| Seafood and plant protein, servings/day | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 | 0.14 |
| Fatty acids, (PUFA+MUFA)/SFA | 1.9 | 1.9 | 1.8 | 1.8 | 1.8 | 0.77 |
| Refined grains, servings/day | 2.5 | 2.6 | 2.5 | 2.6 | 2.4 | 0.71 |
| Sodium, mg/day | 2533 | 2517 | 2446 | 2448 | 2441 | 0.63 |
| Empty calories, % Energy | 17.1 | 18.1 | 17.7 | 16.8 | 17.7 | 0.14 |
| Male, *n* = 1,726 | | | | | | |
| Fruit and vegetables, servings/day | 6.9 | 6.7 | 6.9 | 6.6 | 6.4 | 0.48 |
| Whole fruit, servings/day | 2.0 | 1.7 | 2.0 | 2.0 | 1.8 | 0.11 |
| Greens and beans, servings/day | 0.8 | 0.9 | 0.9 | 0.9 | 0.9 | 0.50 |
| Whole grains, servings/day | 0.7 | 0.7 | 0.8 | 0.7 | 0.7 | 0.91 |
| Dairy, servings/day | 1.6 | 1.6 | 1.6 | 1.6 | 1.6 | 0.95 |
| Total protein foods, servings/day | 1.7 | 1.8 | 1.8 | 1.9 | 1.8 | 0.87 |
| Seafood and plant protein, servings/day | 0.4 | 0.3 | 0.4 | 0.4 | 0.4 | 0.73 |
| Fatty acids, (PUFA+MUFA)/SFA | 1.8 | 1.9 | 1.8 | 1.8 | 1.8 | 0.46 |
| Refined grains, servings/day | 2.7 | 2.7 | 2.6 | 2.8 | 2.6 | 0.80 |
| Sodium, mg/day | 2652 | 2696 | 2642 | 2671 | 2602 | 0.96 |
| Empty calories, % Energy | 19.6 | 19.6 | 18.9 | 17.7 | 20.0 | 0.10 |
| Female, *n* = 1,992 | | | | | | |
| Fruit and vegetables, servings/day | 7.5 | 7.3 | 7.3 | 7.1 | 7.0 | 0.78 |
| Whole fruit, servings/day | 2.6 | 2.3 | 2.5 | 2.3 | 2.3 | 0.09 |
| Greens and beans, servings/day | 1.3 | 1.2 | 1.1 | 1.1 | 1.2 | 0.12 |
| Whole grains, servings/day | 0.6 | 0.5 | 0.5 | 0.4 | 0.5 | 0.04 |
| Dairy, servings/day | 1.9 | 1.6 | 1.7 | 1.7 | 1.7 | 0.21 |
| Total protein foods, servings/day | 1.8 | 1.6 | 1.6 | 1.5 | 1.6 | 0.08 |
| Seafood and plant protein, servings/day | 0.6 | 0.5 | 0.5 | 0.5 | 0.5 | 0.07 |
| Fatty acids, (PUFA+MUFA)/SFA | 1.9 | 1.9 | 1.9 | 1.9 | 1.9 | 0.94 |
| Refined grains, servings/day | 2.4 | 2.5 | 2.3 | 2.3 | 2.3 | 0.63 |
| Sodium, mg/day | 2407 | 2343 | 2249 | 2234 | 2278 | 0.35 |
| Empty calories, % Energy | 14.8 | 16.5 | 16.5 | 15.9 | 15.5 | 0.08 |

Mean values are adjusted for sex (combined sample only) and age.
HEI-C, Canadian adaptation of the Healthy Eating Index 2010; PRS, polygenic risk score for obesity

**Table S6:** 23 genes variants identified by Locke et al.[1] are among the top 25 BMI susceptibility genes with highest expression in brain regions (insula and substantia nigra)[2].

| SNP ID | SNP | Chr | Nearest genes | Effect-allele on BMI |
|---|---|---|---|---|
| 1 | rs657452 | 1 | *AGBL4* | G |
| 2 | rs7138803 | 12 | *BCDIN3D* | A |
| 3 | rs205262 | 6 | *C6orf106* | G |
| 4 | rs13078960 | 3 | *CADM2* | G |
| 5 | rs11583200 | 1 | *ELAVL4* | T |
| 6 | rs7599312 | 2 | *ERBB4* | G |
| 7 | rs1516725 | 3 | *ETV5* | C |
| 8 | rs9400239 | 6 | *FOXO3* | C |
| 9 | rs1558902 | 16 | *FTO* | A |
| 10 | rs7899106 | 10 | *GRID1* | G |
| 11 | rs11727676 | 4 | *HHIP* | T |
| 12 | rs1167827 | 7 | *HIP1* | G |
| 13 | rs2121279 | 2 | *LRP1B* | T |
| 14 | rs16951275 | 15 | *MAP2K5* | T |
| 15 | rs2820292 | 1 | *NAV1* | C |
| 16 | rs3101336 | 1 | *NEGR1* | C |
| 17 | rs7141420 | 14 | *NRXN3* | T |
| 18 | rs11191560 | 10 | *NT5C2* | C |
| 19 | rs1000940 | 17 | *RABEP1* | G |
| 20 | rs2033732 | 8 | *RALYL* | C |
| 21 | rs10132280 | 14 | *STXBP6* | C |
| 22 | rs2075650 | 19 | *TOMM40* | A |
| 23 | rs1528435 | 2 | *UBE2E3* | T |

SNP, single nuclear polymorphism; Chr, chromosome


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2. Ndiaye, F.K.; Huyvaert, M.; Ortalli, A.; Canouil, M.; Lecoeur, C.; Verbanck, M.; Lobbens, S.; Khamis, A.; Marselli, L.; Marchetti, P., et al. The expression of genes in top obesity-associated loci is enriched in insula and substantia nigra brain regions involved in addiction and reward. *Int J Obes (Lond)* **2020**, *44*, 539-543, doi:10.1038/s41366-019-0428-7.