**Supplementary Table 1.** Genotype distribution and allele frequencies of the *FTO-rs9939609*, *MC4R-rs17782313*, *LEP-rs7799039* and *LEPR-rs1137101* gene polymorphisms

|  |  |  |
| --- | --- | --- |
| **SNPs** | **Study sample** |  |
|  | n (%) | *p-value (HW)*† |  |
|  |  |  |  |
| ***FTO-rs9939609* (n=146)** |  |  |  |
| TT | 47 (32.2) | 0.518 |  |
| AT | 75 (51.4) |  |  |
| AA | 24 (16.4) |  |  |
|  |  |  |  |
| T-allele | 169 (58.0) |  |  |
| A-allele | 123 (42.0) |  |  |
|  |  |  |  |
| ***MC4R-rs17782313* (n=145)** |  |  |  |
| TT | 94 (64.8) | 0.511 |  |
| CT | 47 (32.4) |  |  |
| CC | 4 (2.8) |  |  |
|  |  |  |  |
| T-allele | 235 (81.0) |  |  |
| C-allele | 55 (19.0) |  |  |
|  |  |  |  |
| ***LEP-rs7799039* (n=147)** |  |  |  |
| GG | 70 (47.6) | 0.816 |  |
| GA | 62 (42.2) |  |  |
| AA | 15 (10.2) |  |  |
|  |  |  |  |
| G-allele | 202 (69.0) |  |  |
| A-allele | 92 (31.0) |  |  |
|  |  |  |  |
| ***LEPR-rs1137101* (n=147)** |  |  |  |
| AA | 39 (26.5) | 0.364 |  |
| AG | 68 (46.3) |  |  |
| GG | 40 (27.2) |  |  |
|  |  |  |  |
| A-allele | 146 (50.0) |  |  |
| G-allele | 148 (50.0) |  |  |

**Abbreviations:** SNPs = single nucleotide polymorphisms; *FTO* = fat mass and obesity-associated gene; *MC4R* = melanocortin-4 receptor gene; *LEP* = leptin; *LEPR* = leptin receptor; HW = Hardy–Weinberg equilibrium.

**Note:**

†Hardy–Weinberg equilibrium test, p-value refers to Pearson *χ*2 tests.

(*FTO* = TT, Wild type; AT, heterozygote; and AA, homozygote for risk allele); (*MC4R* = TT, Wild type; CT, heterozygote; and CC, homozygote for risk allele); (*LEP* = GG, Wild type; GA, heterozygote; and AA, homozygote for risk allele); (*LEPR* = AA, Wild type; AG, heterozygote; and GG, homozygote for risk allele).

**Supplementary Table 2**. Pre-pregnancy and pregnancy maternal dietary intake according to genotype groups of the *FTO-rs9939609, MC4R-rs17782313, LEP-rs7799039* and *LEPR-rs1137101* polymorphisms

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **Pre-pregnancy** |  |  | **Pregnancy** |  |
|  | Mean | (95% CI) |  | Mean | (95% CI) | p-value |  | Mean | (95% CI) |  | Mean | (95% CI) | p-value\* |
|  | ***FTO-rs9939609*** |
|  | TT (n=47) |  | AT+AA (n=97) |  |  | TT (n=47) |  | AT+AA (n=92) |  |
| (log) Total energy (kcal/day)a | 2311 | (2088, 2557) |  | 2240 | (2096, 2393) | 0.60 |  | 2091 | (1904, 2297) |  | 2376 | (2223, 2539) | 0.03 |
| ***% of energy from*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (ln) Proteina | 16.4 | (15.5, 17.3) |  | 15.7 | (15.1, 16.3) | 0.20 |  | 16.7 | (15.7, 17,7) |  | 15.8 | (15.1, 16.5) | 0.13 |
| Carbohydrates | 54.6 | (52.7, 56.4) |  | 57.3 | (55.9, 58.2) | 0.02 |  | 58.3 | (56.7, 59.9) |  | 58.4 | (57.3, 59.4) | 0.96 |
| Fat | 27.6 | (25.9, 29.3) |  | 26.1 | (25.3, 27.0) | 0.10 |  | 24.6 | (23.3, 25.9) |  | 25.4 | (24.5, 26.2) | 0.32 |
| Ultra-processed foods | 47.0 | (43.6, 50.4) |  | 46.9 | (44.5, 49.4) | 0.97 |  | 40.6 | (36.9, 44.3) |  | 45.9 | (43.0, 48.8) | 0.03 |
|  | ***MC4R-rs17782313*** |
|  | TT (n=93) |  | CT+CC (n=50) |  |  | TT (n=90) |  | CT+CC (n=48) |  |
| (ln) Total energy (kcal/day)a | 2304 | (2151, 2468) |  | 2224 | (2027, 2440) | 0.54 |  | 2348 | (2191, 2515) |  | 2148 | (1966, 2347) | 0.12 |
| ***% of energy from*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (log) Proteina | 16.1 | (15.5, 16.7) |  | 15.7 | (14.9, 16.6) | 0.51 |  | 16.4 | (15.7, 17.1) |  | 15.5 | (14.6, 16.5) | 0.13 |
| Carbohydrates | 56.4 | (55.2, 57.7) |  | 56.0 | (54.4, 57.7) | 0.70 |  | 58.2 | (57.1, 59.3) |  | 58.9 | (57.3, 60.5) | 0.45 |
| Fat | 26.1 | (25.1, 27.2) |  | 27.3 | (25.9, 28.7) | 0.18 |  | 25.0 | (24.1, 25.9) |  | 25.1 | (23.9, 26.4) | 0.84 |
| Ultra-processed foods | 45.7 | (43.2, 48.3) |  | 49.2 | (46.2, 52.3) | 0.10 |  | 42.9 | (39.9, 45.8) |  | 45.9 | (42.4, 49.4) | 0.21 |
|  | ***LEP-rs7799039*** |
|  | GG (n=69) |  | GA+AA (n=76) |  |  | GG (n=64) |  | GA+AA (n=75) |  |
| (ln) Total energy (kcal/day)a | 2227 | (2091, 2466) |  | 2280 | (2116, 2457) | 0.94 |  | 2391 | (2218, 2579) |  | 2199 | 2032, 2379) | 0.13 |
| ***% of energy from*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (log) Proteina | 15.8 | (15.0, 16.6) |  | 16.0 | (15.4, 16.6) | 0.71 |  | 15.5 | (14.7, 16.3) |  | 16.6 | (15.8, 17.4) | 0.05 |
| Carbohydrates | 55.6 | (54.1, 57.1) |  | 56.7 | (55.4, 58.0) | 0.30 |  | 58.9 | (57.7, 60.1) |  | 57.9 | (56.5, 59.2) | 0.25 |
| Fat | 27.2 | (26.0, 28.5) |  | 26.3 | (25.2, 27.4) | 0.27 |  | 25.2 | (24.2, 26.3) |  | 25.0 | (24.0, 26.1) | 0.79 |
| Ultra-processed foods | 47.6 | (44.6, 50.5) |  | 47.1 | (44.2, 50.0) | 0.82 |  | 44.8 | (41.2, 48.0) |  | 43.2 | (39.9, 46.5) | 0.49 |
|  | ***LEPR-rs1137101*** |
|  | AA (n=39) |  | AG+GG (n=106) |  |  | AA (n=35) |  | AG+GG (n=104) |  |
| (ln) Total energy (kcal/day)a | 2294 | (2066, 2546) |  | 2275 | (2132, 2427) | 0.90 |  | 2347 | (2124, 2593) |  | 2254 | (2111, 2406) | 0.52 |
| ***% of energy from*** |  |  |  |  |  |  |  |  |  |  |  |  |  |
| (log) Proteina | 15.2 | (14.4, 16.1) |  | 16.1 | (15.5, 16.7) | 0.12 |  | 16.3 | (15.1, 17.6) |  | 16.0 | (15.4, 16.6) | 0.63 |
| Carbohydrates | 56.7 | (54.8, 58.5) |  | 56.2 | (55.0, 57.3) | 0.64 |  | 57.4 | (55.6, 59.2) |  | 58.7 | (57.7, 59.7) | 0.63 |
| Fat | 27.1 | (25.4, 28.8) |  | 26.5 | (25.6, 27.4) | 0.48 |  | 25.8 | (24.4, 27.2) |  | 24.9 | (24.0, 25.7) | 0.24 |
| Ultra-processed foods | 50.4 | (46.2, 54.6) |  | 46.2 | (44.0, 48.5) | 0.06 |  | 43.6 | (38.7, 48.5) |  | 44.4 | (41.7, 47.0) | 0.79 |

**Abbreviations:** *FTO* = fat mass and obesity-associated gene; *MC4R* = melanocortin-4 receptor gene; *LEP* = leptin; *LEPR* = leptin receptor; CI = confidence interval.

**Notes:**

aPre-pregnancy and pregnancy natural logarithms (ln) values were used, but estimates provided in the table were back-transformed and data are presented as geometric means (95%CI).

\*p-value refers to Student’s t-test.

**Supplementary Table 3**. Difference between maternal dietary intake from pre-pregnancy to pregnancy according to genotype groups of the *FTO-rs9939609, MC4R-rs17782313, LEP-rs7799039* and *LEPR-rs1137101* polymorphisms

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Gene** |  | **Genotypes** | **Pre-pregnancy** |  | **Pregnancy** |  | **Delta** (∆)‡ |
|  | Mean (95% CI) |  | Mean (95% CI) |  | Mean (95% CI) | *p-value\** |
|  |  | **Total energy (kcal/day)** |
| ***FTO*** |  | TT (n=47) | 2451.9 (2187.3, 2716.5) |  | 2192.1 (1997.9, 2386.4) |  | -259.8 (-494.9, -24.7) | 0.03 |
|  |  | AT+AA (n=90) | 2354.7 (2202.9, 2506.4) |  | 2467.3 (2309.2, 2625.5) |  | 112.6 (-68.2, 293.6) | 0.22 |
|  |  |  |  |  |  |  |  |  |
| ***MC4R*** |  | TT (n=89) | 2423.9 (2256.6, 2591.3) |  | 2463.8 (2303.0, 2624.6) |  | 39.8 (-146.6, 226.3) | 0.67 |
|  |  | CT+CC (n=47) | 2356.2 (2129.4, 2582.9) |  | 2196.1 (2017.2, 2375.0) |  | -160.1 (-385.8, 65.5) | 0.16 |
|  |  |  |  |  |  |  |  |  |
| ***LEP*** |  | GG (n=63) | 2413.3 (2199.9, 2626.6) |  | 2488.3 (2312.6, 2663.9) |  | 75.0 (-164.3, 314.3) | 0.53 |
|  |  | GA+AA (n=74) | 2380.2 (2209.3, 2551.1) |  | 2295.4 (2119.0, 2471.9) |  | -84.8 (-265.0, 95.5) | 0.35 |
|  |  |  |  |  |  |  |  |  |
| ***LEPR*** |  | AA (n=35) | 2320.0 (2061.2, 2578.9) |  | 2443.5 (2200.8, 2686.3) |  | 123.5 (-148.5, 395.4) | 0.36 |
|  |  | AG+GG (n=102) | 2426.0 (2269.7, 2582.3) |  | 2351.2 (2204.6, 2497.8) |  | -74.8 (-245.1, 95.5) | 0.39 |
|  |  | **% of energy from Protein** |
| ***FTO*** |  | TT (n=47) | 16.7 (15.8, 17.5) |  | 17.0 (16.0, 18.0) |  | 0.36 (-0.56, 1.28) | 0.44 |
|  |  | AT+AA (n=90) | 16.1 (15.4, 16.7) |  | 16.2 (15.4, 16.9) |  | 0.11 (-0.69, 0.91) | 0.78 |
|  |  |  |  |  |  |  |  |  |
| ***MC4R*** |  | TT (n=89) | 16.3 (15.7, 17.0) |  | 16.7 (16.0, 17.5) |  | 0.41 (-0.37, 1.19) | 0.30 |
|  |  | CT+CC (n=47) | 16.1 (15.2, 17.0) |  | 15.9 (14.9, 16.9) |  | -0.20 (-1.20, 0.79) | 0.66 |
|  |  |  |  |  |  |  |  |  |
| ***LEP*** |  | GG (n=63) | 16.3 (15.5, 17.1) |  | 15.8 (15.0, 16.6) |  | -0.53 (-1.44, 0.38) | 0.25 |
|  |  | GA+AA (n=74) | 16.2 (15.6, 16.8) |  | 17.0 (16.2, 17.9) |  | 0.79 (-0.01, 1.60) | 0.05 |
|  |  |  |  |  |  |  |  |  |
| ***LEPR*** |  | AA (n=35) | 15.7 (14.8, 16.6) |  | 16.7 (15.4, 18.0) |  | 0.99 (-0.36, 2.34) | 0.15 |
|  |  | AG+GG (n=102) | 16.4 (15.8, 17.0) |  | 16.4 (15.7, 17.0) |  | -0.01 (-0.67, 0.67) | 0.99 |
|  |  | **% of energy from Carbohydrates** |
| ***FTO*** |  | TT (n=47) | 54.6 (52.7, 56.4) |  | 58.3 (56.7, 59.9) |  | 3.75 (1.42, 6.08) | <0.01 |
|  |  | AT+AA (n=90) | 57.0 (55.9, 58.2) |  | 58.3 (57.2, 59.4) |  | 1.25 (-0.18, 2.68) | 0.09 |
|  |  |  |  |  |  |  |  |  |
| ***MC4R*** |  | TT (n=89) | 57.0 (55.3, 57.9) |  | 58.2 (57.1, 59.3) |  | 1.56 (0.01, 3.12) | 0.05 |
|  |  | CT+CC (n=47) | 55.6 (53.9, 57.3) |  | 58.8 (57.2, 60.4) |  | 3.21 (1.10, 5.31) | <0.01 |
|  |  |  |  |  |  |  |  |  |
| ***LEP*** |  | GG (n=63) | 55.6 (54.0, 57.1) |  | 58.9 (57.7, 60.1) |  | 3.34 (1.47, 5.22) | <0.01 |
|  |  | GA+AA (n=74) | 56.6 (55.3, 58.0) |  | 57.8 (56.4, 59.2) |  | 1.16 (-0.47, 2.79) | 0.16 |
|  |  |  |  |  |  |  |  |  |
| ***LEPR*** |  | AA (n=35) | 56.8 (54.8, 58.9) |  | 57.4 (55.6, 59.2) |  | 0.57 (-1.95, 3.06) | 0.65 |
|  |  | AG+GG (n=102) | 56.1 (54.9, 57.2) |  | 58.6 (57.6, 59.7) |  | 2.58 (1.16, 4.00) | <0.01 |
|  |  | **% of energy from Fat** |
| ***FTO*** |  | TT (n=47) | 27.6 (25.9, 29.3) |  | 24.6 (23.3, 25.9) |  | -2.97 (-5.03, -0.91) | 0.01 |
|  |  | AT+AA (n=90) | 26.1 (25.2, 27.0) |  | 25.4 (24.5, 26.3) |  | -0.71 (-1.76, 0.33) | 0.18 |
|  |  |  |  |  |  |  |  |  |
| ***MC4R*** |  | TT (n=89) | 26.0 (25.0, 27.1) |  | 25.0 (24.1, 25.9) |  | -1.03 (-2.27, 0.22) | 0.10 |
|  |  | CT+CC (n=47) | 27.6 (26.1, 29.0) |  | 25.1 (23.9, 26.4) |  | -2.43 (-4.11, -0.76) | <0.01 |
|  |  |  |  |  |  |  |  |  |
| ***LEP*** |  | GG (n=63) | 27.2 (25.8, 28.5) |  | 25.3 (24.2, 26.3) |  | -1.92 (-3.32, -0.52) | 0.01 |
|  |  | GA+AA (n=74) | 26.2 (25.1, 27.4) |  | 25.0 (23.9, 26.1) |  | -1.21 (-2.63, 0.20) | 0.09 |
|  |  |  |  |  |  |  |  |  |
| ***LEPR*** |  | AA (n=35) | 26.8 (25.0, 28.7) |  | 25.8 (24.4, 27.2) |  | -1.00 (-2.92, 0.92) | 0.30 |
|  |  | AG+GG (n=102) | 26.5 (25.6, 27.5) |  | 24.8 (24.0, 25.7) |  | -1.69 (-2.86, -0.52) | <0.01 |
|  |  | **% of energy from Ultra-processed foods** |
| ***FTO*** |  | TT (n=47) | 47.0 (43.6, 50.4) |  | 40.6 (36.9, 44.3) |  | -6.40 (-10.18, -2.63) | <0.01 |
|  |  | AT+AA (n=90) | 46.7 (44.1, 49.3) |  | 45.6 (42.7, 48.5) |  | -1.07 (-3.87, 1.73) | 0.45 |
|  |  |  |  |  |  |  |  |  |
| ***MC4R*** |  | TT (n=89) | 45.5 (42.9, 48.2) |  | 42.8 (39.8, 45.8) |  | -2.71 (-5.69, 0.26) | 0.07 |
|  |  | CT+CC (n=47) | 49.2 (46.0, 52.5) |  | 45.4 (42.0, 48.8) |  | -3.82 (-7.41, -0.23) | 0.04 |
|  |  |  |  |  |  |  |  |  |
| ***LEP*** |  | GG (n=63) | 46.8 (43.8, 49.9) |  | 44.7 (41.5, 48.0) |  | -2.09 (-5.41, 1.23) | 0.21 |
|  |  | GA+AA (n=74) | 47.1 (44.2, 50.0) |  | 42.8 (39.5, 46.1) |  | -4.28 (-7.49, -1.08) | 0.01 |
|  |  |  |  |  |  |  |  |  |
| ***LEPR*** |  | AA (n=35) | 49.4 (45.0, 53.8) |  | 43.6 (38.7, 48.5) |  | -5.77 (-11.15, -0.40) | 0.04 |
|  |  | AG+GG (n=102) | 46.2 (43.8, 48.5) |  | 44.1 (41.4, 46.7) |  | -2.11 (-4.59, 0.37) | 0.09 |

**Abbreviations:** *FTO* = fat mass and obesity-associated gene; *MC4R* = melanocortin-4 receptor gene; *LEP* = leptin; *LEPR* = leptin receptor; CI = confidence interval.

**Notes:**

‡Delta (∆) refers to the difference between values during pregnancy and pre-pregnancy calculated with the non-transformed variable (the results of the differences were normally distributed).

\*p-value refers to paired Student’s t-test.

**Supplementary Table 4**. Power of the study sample size considering the dominant inheritance model for each outcome and polymorphism

|  |  |
| --- | --- |
|  | **Power (%)**† |
|  | ***Total energy (kcal/day)*** | ***% of energy from Protein*** | ***% of energy from Carbohydrates*** | ***% of energy from Fat*** | ***% of energy from ultraprocessed*** |
| ***FTO-rs9939609*** | 5.51 | 30.49 | 30.49 | 16.21 | 6.52 |
| ***MC4R-rs17782313*** | 13.17 | 8.34 | 6.47 | 25.03 | 5.20 |
| ***LEP-rs7799039*** | 14.72 | 30.26 | 11.15 | 32.80 | 36.77 |
| ***LEPR-rs1137101*** | 9.58 | 29.13 | 10.88 | 5.74 | 19.43 |

**Abbreviations**: FTO = fat mass and obesity-associated gene; MC4R = melanocortin-4 receptor gene; LEP = leptin; LEPR = leptin receptor.

**Notes:**

†The dominant genetic model was considered for the power analysis.