**Table S8. Association and interaction analyses of PRS2 made with SNPs from *Yengo et. al.* with BMI**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Study** | **Polygenic Risk Score** | **TEST** | | **BMI** | |
| **Beta (SE)** | ***P*** |
| **KARE** | **PRS2** | **genetic effect (G)** | | 0.0151 (0.0010) | **3.84E-51** |
| **interaction effect (GxE)** | calorie intake (1-SD) | 0.0009 (0.0009) | 0.321 |
| protein (1-SD) | 0.0007 (0.0009) | 0.428 |
| fat (1-SD) | 0.0011 (0.0009) | 0.201 |
| carbohydrate (1-SD) | 0.0000 (0.0009) | 0.985 |
| **PRS2*unweighted*** | **genetic effect (G)** | | 0.0269 (0.0020) | **9.07E-41** |
| **interaction effect (GxE)** | calorie intake (1-SD) | 0.0020 (0.0018) | 0.256 |
| protein (1-SD) | 0.0017 (0.0018) | 0.344 |
| fat (1-SD) | 0.0023 (0.0018) | 0.200 |
| carbohydrate (1-SD) | 0.0000 (0.0018) | 0.992 |
| **CAVAS** | **PRS2** | **genetic effect (G)** | | 0.0144 (0.0011) | **9.88E-38** |
| **interaction effect (GxE)** | calorie intake (1-SD) | 0.0003 (0.0010) | 0.794 |
| protein (1-SD) | -0.0004 (0.0010) | 0.692 |
| fat (1-SD) | -0.0003 (0.0010) | 0.728 |
| carbohydrate (1-SD) | -0.0002 (0.0010) | 0.868 |
| **PRS2*unweighted*** | **genetic effect (G)** | | 0.0236 (0.0022) | **1.15E-27** |
| **interaction effect (GxE)** | calorie intake (1-SD) | 0.0002 (0.0020) | 0.903 |
| protein (1-SD) | -0.0008 (0.0020) | 0.689 |
| fat (1-SD) | -0.0005 (0.0019) | 0.787 |
| carbohydrate (1-SD) | -0.0004 (0.0020) | 0.825 |
| **HEXA** | **PRS2** | **genetic effect (G)** | | 0.0052 (0.0004) | **1.05E-41** |
| **interaction effect (GxE)** | calorie intake (1-SD) | 0.0003 (0.0003) | 0.382 |
| protein (1-SD) | 0.0004 (0.0003) | 0.290 |
| fat (1-SD) | 0.0004 (0.0003) | 0.189 |
| carbohydrate (1-SD) | 0.0000 (0.0003) | 0.948 |
| **PRS2*unweighted*** | **genetic effect (G)** | | 0.0094 (0.0008) | **2.27E-35** |
| **interaction effect (GxE)** | calorie intake (1-SD) | 0.0007 (0.0007) | 0.309 |
| protein (1-SD) | 0.0008 (0.0007) | 0.228 |
| fat (1-SD) | 0.0008 (0.0007) | 0.217 |
| carbohydrate (1-SD) | 0.0002 (0.0007) | 0.788 |

The association between PRS2 and phenotype, and PRS2-calorie intakes interaction were analyzed by linear regression model for BMI, adjusted for age, sex, recruitment area and 10 principal components for KARE and adjusted for sex, age and 10 PCs for CAVAS and HEXA.; The significance threshold P < 4.17E-04 (0.05 / 120 through multiple correction)

SE: standard error;