**Supplementary Materials**

**Table S1**. Factor-loading matrix for the dietary patterns and food groups.

|  |  |  |  |
| --- | --- | --- | --- |
| Food groups | Factor 1 | Factor 2 | Factor 3 |
| White meat | 0.783 | 0.071 | 0.155 |
| Fish | 0.734 | 0.073 | 0.054 |
| Red meat | 0.726 | 0.067 | 0.053 |
| Grains | -0.118 | 0.617 | -0.066 |
| Nuts | 0.190 | 0.527 | 0.150 |
| Egg | -0.063 | 0.523 | 0.169 |
| Bean | 0.290 | 0.511 | 0.013 |
| Milk | 0.205 | 0.427 | -0.207 |
| Vegetables | 0.061 | 0.112 | 0.748 |
| Staple food | 0.067 | -0.116 | 0.710 |
| Fruits | 0.272 | 0.283 | 0.403 |

Factor 1, “meat” pattern; factor 2, “grains-nuts-egg” dietary pattern; factor 3, “vegetables-staple-fruits” pattern.

**Table S2.** The relationship between dietary patterns and variables (rs, *p*).

|  |  |  |  |
| --- | --- | --- | --- |
|  | Scores of factor 1 | Scores of factor 2 | Scores of factor 3 |
| FPG | -0.063(<0.001) | 0.029(<0.001) | -0.106(<0.001) |
| INS | 0.102(<0.001) | -0.100(<0.001) | 0.174(<0.001) |
| Staple food | 0.064(<0.001) | -0.130(<0.001) | 0.691(<0.001) |
| Red meat | 0.706(<0.001) | 0.094(<0.001) | 0.061(<0.001) |
| White meat | 0.731(<0.001) | 0.081(<0.001) | 0.173(<0.001) |
| Fish | 0.624(<0.001) | 0.087(<0.001) | 0.082(<0.001) |
| Egg | -0.069(<0.001) | 0.538(<0.001) | 0.129(<0.001) |
| Milk | 0.281(<0.001) | 0.389(<0.001) | -0.195(<0.001) |
| Fruits | 0.308(<0.001) | 0.288(<0.001) | 0.360(<0.001) |
| Vegetables | 0.049(<0.001) | 0.096(<0.001) | 0.725(<0.001) |
| Bean | 0.304(<0.001) | 0.479(<0.001) | -0.006(<0.001) |
| Nuts | 0.211(<0.001) | 0.451(<0.001) | 0.142(<0.001) |
| Grains | -0.118(<0.001) | 0.133(<0.001) | -0.084(<0.001) |

The correlation coefficient was calculated by Spearman’s rank correlation. FPG: Fasting plasma glucose. INS: insulin.

**Table S3.** Consumption of food groups according to quintiles of three dietary patterns.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Food groups  (g/day) | Factor 1 | | | | |  | Factor 2 | | | | |  | Factor 3 | | | | |  |
| Q1 | Q2 | Q3 | Q4 | Q5 | *P t*rend | Q1 | Q2 | Q3 | Q4 | Q5 | *P t*rend | Q1 | Q2 | Q3 | Q4 | Q5 | *P t*rend |
| Staple food | 423.57 | 404.63 | 412.55 | 432.19 | 442.87 | <0.001 | 458.56 | 425.36 | 416.66 | 411.09 | 404.14 | <0.001 | 277.33 | 365.48 | 418.18 | 470.87 | 583.93 | <0.001 |
| Red meat | 7.20 | 11.71 | 22.15 | 41.25 | 72.69 | <0.001 | 28.81 | 28.95 | 30.83 | 31.36 | 35.05 | <0.001 | 29.15 | 29.46 | 31.15 | 31.80 | 33.43 | <0.001 |
| White meat | 2.21 | 3.94 | 8.44 | 16.69 | 33.70 | <0.001 | 11.25 | 12.28 | 13.32 | 13.55 | 14.59 | <0.001 | 10.46 | 10.68 | 12.56 | 14.45 | 16.84 | <0.001 |
| Fish | 0.51 | 0.96 | 2.03 | 4.49 | 10.59 | <0.001 | 3.07 | 3.49 | 3.89 | 3.82 | 4.31 | <0.001 | 3.70 | 3.14 | 3.38 | 4.02 | 4.33 | <0.001 |
| Egg | 71.34 | 46.30 | 49.48 | 55.87 | 54.64 | <0.001 | 21.41 | 41.57 | 56.22 | 69.99 | 88.44 | <0.001 | 48.56 | 51.38 | 52.03 | 56.87 | 68.79 | <0.001 |
| Milk† | 5.55 | 8.57 | 13.05 | 15.00 | 18.17 | <0.001 | 1.48 | 5.03 | 11.25 | 17.65 | 24.94 | <0.001 | 21.15 | 12.41 | 9.96 | 8.91 | 7.90 | <0.001 |
| Fruits | 91.06 | 108.84 | 138.37 | 167.13 | 195.91 | <0.001 | 80.63 | 123.33 | 144.45 | 159.39 | 193.51 | <0.001 | 75.54 | 103.08 | 132.47 | 163.90 | 226.31 | <0.001 |
| Vegetables | 339.17 | 282.30 | 296.88 | 323.07 | 347.31 | <0.001 | 292.20 | 309.76 | 316.02 | 321.67 | 349.07 | <0.001 | 165.19 | 228.95 | 293.96 | 377.75 | 522.86 | <0.001 |
| Bean | 19.54 | 23.34 | 31.76 | 36.73 | 48.15 | <0.001 | 10.32 | 19.98 | 29.34 | 39.81 | 60.06 | <0.001 | 32.48 | 30.56 | 31.76 | 32.72 | 31.99 | 0.353 |
| Nuts | 12.42 | 11.89 | 14.77 | 17.83 | 22.52 | <0.001 | 3.98 | 8.25 | 12.80 | 19.90 | 34.51 | <0.001 | 12.03 | 13.94 | 15.36 | 17.28 | 20.83 | <0.001 |
| Grains | 89.76 | 47.97 | 48.31 | 52.58 | 55.15 | <0.001 | 16.41 | 34.66 | 49.35 | 69.99 | 123.37 | <0.001 | 69.73 | 59.15 | 55.74 | 56.13 | 53.02 | <0.001 |

†The unit is ml/day.Q1-Q5, the quintile for the factor scores. *P*tre**nd,** *P*-value was assessed using the trend Chi-square tests. Factor 1, “meat” pattern; factor 2, “grains-nuts-egg” dietary pattern; factor 3, “vegetables-staple-fruits” pattern.

**Table S4.** Subject characteristics according to the dietary patterns.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  | Dietary patternⅠ | Dietary pattern Ⅱ | Dietary pattern Ⅲ | /F | *p* |
| N（%） | | 12071(31.1) | 12823(33.1) | 13885(35.8) |  |  |
| Gender (n,%) | |  |  |  | 201.351 | <0.001 |
|  | Men | 5002(41.4) | 4445(34.7) | 5921(42.6) |  |  |
|  | Women | 7069(58.6) | 8378(65.3) | 7964(57.4) |  |  |
| Age (years),mean±SD | | 52.78(12.72) | 56.59(12.83) | 57.07(10.62) | 476.381 | <0.001 |
| Education level (n,%) | |  |  |  | 765.353 | <0.001 |
|  | Illiteracy | 1660(13.8) | 2126(16.6) | 2668(19.2) |  |  |
|  | Primary school | 2954(24.5) | 3519(27.4) | 4424(31.9) |  |  |
|  | Middle school | 5176(42.9) | 4853(37.8) | 5417(39.0) |  |  |
|  | High school | 1780(14.7) | 1849(14.4) | 1210(8.7) |  |  |
|  | College and above | 501(4.1) | 476(3.7) | 166(1.2) |  |  |
| Marry (n,%) | |  |  |  | 65.985 | <0.001 |
|  | Married | 10945(90.7) | 11427(89.1) | 12431(89.5) |  |  |
|  | Widowed | 823(6.8) | 1167(9.1) | 1171(8.4) |  |  |
|  | Divorced | 86(0.7) | 44(0.3) | 79(0.6) |  |  |
|  | Single | 217(1.8) | 185(1.4) | 204(1.5) |  |  |
| Region (n,%) | |  |  |  | 7978.692 | <0.001 |
|  | Yuzhou | 4078(33.8) | 2192(17.1) | 2908(20.9) |  |  |
|  | Zhumadian | 4792(39.7) | 2650(20.7) | 8401(60.5) |  |  |
|  | Kaifeng | 739(6.1) | 1038(8.1) | 697(5.0) |  |  |
|  | Xinxiang | 2226(18.4) | 6571(51.2) | 1550(11.2) |  |  |
|  | Yima | 236(2.0) | 372(2.9) | 329(2.4) |  |  |
| Income (n,%) | |  |  |  | 529.438 | <0.001 |
|  | ≤500 RMB | 3530(29.2) | 4703(36.7) | 5577(40.2) |  |  |
|  | ~1000 RMB | 3988(33.0) | 4336(33.8) | 4451(32.1) |  |  |
|  | ~2000 RMB | 3371(27.9) | 2821(22.0) | 3116(22.4) |  |  |
|  | ~3000 RMB | 756(6.3) | 606(4.7) | 535(3.9) |  |  |
|  | ≥3000 RMB | 426(3.5) | 357(2.8) | 206(1.5) |  |  |
| Smoking (n,%) | |  |  |  | 174.846 | <0.001 |
|  | Never | 8455(70.0) | 9801(76.4) | 9932(71.5) |  |  |
|  | Ever | 946(7.8) | 957(7.5) | 1230(8.9) |  |  |
|  | Current | 2670(22.1) | 2065(16.1) | 2723(19.6) |  |  |
| Drinking (n,%) | |  |  |  | 390.139 | <0.001 |
|  | Never | 8678(71.9) | 16361(80.8) | 10910(78.6) |  |  |
|  | Ever | 534(4.4) | 529(4.1) | 731(5.3) |  |  |
|  | Current | 2859(23.7) | 1933(15.1) | 2244(16.2) |  |  |
| Physical activity (n,%) | | |  |  | 487.248 | <0.001 |
|  | Low | 4070(33.7) | 4823(37.6) | 3646(26.3) |  |  |
|  | Moderate | 4699(38.9) | 4138(32.3) | 5784(41.7) |  |  |
|  | High | 3302(27.4) | 3862(30.1) | 4455(32.1) |  |  |
| Family history of diabetes（n,%) | | |  |  | 27.516 | <0.001 |
|  | No | 11485(95.1) | 12286(95.8) | 13392(96.4) |  |  |
|  | Yes | 586(4.9) | 537(4.2) | 493(3.6) |  |  |

Continuous data is presented as mean and standard deviation and using one-way ANOVA assessed the *P* value. Categorical data are presented as number and percentage, and using chi-square test.

**Table S5.** Odds ratios (95% *CIs*) for Pre-diabetes and T2DM according intakes of food groups

|  |  |  |  |
| --- | --- | --- | --- |
| Groups | Food groups | Crude | Adjusted Model |
| T2DM |  |  |  |
| Staple food | 1.000(0.999,1.000) | 1.000(0.999,1.000) |
| Red meat | 0.998(0.997,0.999) | 1.001(1.000,1.003) |
|  | White meat | 0.991(0.989,0.993) | 0.998(0.996,1.001) |
|  | Fish | 0.986(0.979,0.992) | 1.007(0.999,1.014) |
|  | Egg | 0.999(0.998,1.000) | 0.999(0.998,1.000) |
|  | Milk | 1.001(1.000,1.003) | 1.004(1.002,1.005) |
|  | Fruits | 0.998(0.997,0.998) | 0.998(0.998,0.998) |
|  | Vegetables | 1.000(0.999,1.000) | 1.000(1.000,1.000) |
|  | Bean | 1.001(1.000,1.002) | 1.003(1.002,1.004) |
|  | Nuts | 0.999(0.997,1.000) | 1.001(0.999,1.002) |
|  | Grains | 1.000(1.000,1.001) | 1.000(0.999,1.000) |
| Pre-diabetes |  |  |  |
|  | Staple food | 0.999(0.999,0.999) | 1.000(0.999,1.001) |
|  | Red meat | 0.997(0.996,0.999) | 1.000(0.999,1.002) |
|  | White meat | 0.993(0.990,0.995) | 0.999(0.996,1.002) |
|  | Fish | 0.980(0.973,0.988) | 0.994(0.986,1.003) |
|  | Egg | 1.000(0.999,1.001) | 1.000(0.999,1.001) |
|  | Milk | 0.996(0.994,0.998) | 0.997(0.995,0.999) |
|  | Fruits | 0.999(0.999,0.999) | 1.000(0.999,1.000) |
|  | Vegetables | 0.999(0.999,0.999) | 0.999(0.999,1.000) |
|  | Bean | 1.000(0.998,1.001) | 1.001(1.000,1.002) |
|  | Nuts | 0.998(0.997,1.000) | 1.000(0.998,1.002) |
|  | Grains | 1.002(1.001,1.002) | 1.001(1.000,1.001) |

Crude: unadjusted. Adjusted Model: adjusted for age, region, gender, education level, marital status, per capita monthly income, BMI, smoking, alcohol drinking, physical activity, family history of diabetes, and energy. *CI*, confidence interval.T2DM, type 2diabetes mellitus.