**Supplementary data**

**Supplemental Table 1** Associations between spicy food flavor and blood lipid levels after excluding participants with self-reported coronary heart disease, stroke

**Supplemental Table 2** Associations between spicy food intake frequency and blood lipid levels after excluding participants with self-reported coronary heart disease, stroke

**Supplemental Table 3** Multivariate adjusted *OR*s for abnormal lipid levels according to spicy food flavor and spicy food intake frequency after excluding participants with self-reported coronary heart disease and stroke

**Supplemental Table 4** Multivariate adjusted *OR*s for abnormal lipid levels according to spicy food flavor and spicy food intake frequency after additional adjustment for dietary pattern and family history of hyperlipidemia, coronary heart disease and stroke

**Supplemental Table 1** Associations between spicy food flavor and blood lipid levels after excluding participants with self-reported coronary heart disease, stroke

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Flavor of spicy food (N=34272)** | | | | | | | | ***P* for linear trend** |
|  | **No** | | **Mild** | | **Middle** | | **Heavy** | |
| **No. participants** | 14293 | | 13638 | | 4944 | | 1397 | |  |
| **TC (mmol/L)** | 4.82 | 1.00 | 4.72 | 0.95 | 4.66 | 0.93 | 4.60 | 0.90 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | -0.07(-0.09, -0.04) | | -0.09(-0.12, -0.06) | | -0.13(-0.18, -0.08) | | <0.001 |
| Adjusted β (95% CI)2 | Ref. | | -0.04(-0.06, -0.01) | | -0.07(-0.11, -0.04) | | -0.14(-0.20, -0.09) | | <0.001 |
| **TG (mmol/L)** | 1.63 | 1.05 | 1.67 | 1.14 | 1.73 | 1.23 | 1.84 | 1.30 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | 0.02 (-0.01, 0.04) | | 0.05 (0.02, 0.09) | | 0.15 (0.09, 0.21) | | <0.001 |
| Adjusted β (95% CI)2 | Ref. | | 0.03 (-0.03, 0.06) | | 0.06 (0.02, 0.10) | | 0.17 (0.11, 0.24) | | <0.001 |
| **LDL-C (mmol/L)** | 2.91 | 0.82 | 2.85 | 0.80 | 2.84 | 0.80 | 2.80 | 0.77 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | -0.02 (-0.04, 0.003) | | -0.01(-0.03, 0.02) | | -0.05 (-0.10, -0.01) | | 0.013 |
| Adjusted β (95% CI)2 | Ref. | | -0.01 (-0.03, 0.02) | | 0.01(-0.03, 0.04) | | -0.05 (-0.10, -0.001) | | 0.29 |
| **HDL-C (mmol/L)** | 1.34 | 0.33 | 1.33 | 0.33 | 1.32 | 0.34 | 1.29 | 033 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | -0.002 (-0.01, 0.01) | | 0.01(-0.01, 0.02) | | -0.02 (-0.04, -0.001) | | 0.59 |
| Adjusted β (95% CI)2 | Ref. | | 0.004 (-0.01, 0.01) | | 0.01 (0.002, 0.02) | | -0.02 (-0.04, -0.001) | | 0.80 |
| **LDL-C/HDL-C (mmol/L)** | 2.29 | 0.80 | 2.27 | 0.80 | 2.27 | 0.81 | 2.28 | 0.80 | 0.51 |
| Adjusted β (95% CI)1 | Ref. | | -0.01 (-0.03, 0.01) | | -0.01 (-0.04, 0.01) | | -0.01 (-0.05, 0.03) | | 0.11 |
| Adjusted β (95% CI)2 | Ref. | | -0.01 (-0.03, 0.01) | | -0.02 (-0.05, 0.01) | | -0.01 (-0.05, 0.05) | | 0.10 |
| **Non-HDL-C (mmol/L)** | 3.48 | 0.97 | 3.40 | 0.94 | 3.34 | 0.93 | 3.32 | 0.91 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | -0.07(-0.09, -0.04) | | -0.10(-0.13, -0.07) | | -0.11(-0.16, -0.06) | | <0.001 |
| Adjusted β (95% CI)2 | Ref. | | -0.04(-0.07, -0.02) | | -0.09(-0.12, -0.05) | | -0.12(-0.18, -0.07) | | <0.001 |

Abbreviations: TC, total cholesterol; TG, triglycerides; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; Non-HDL-C, nonhigh density lipoprotein cholesterol; *CI,* confidence interval, Ref*,* reference, BMI*,* body mass index.

1: Adjusted for age, gender, education level, marital status, smoking status, alcohol drinking, physical activity, BMI and total energy intake.

2: Additionally adjusting for dietary pattern, family history of hyperlipidemia, coronary heart disease and stroke.

**Supplemental Table 2** Associations between spicy food intake frequency and blood lipid levels after excluding participants with self-reported coronary heart disease, stroke

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Frequency of spicy food intake (N=25750)** | | | | | | | | ***P* for linear trend** |
|  | **Never** | | **1-2d/week** | | **3-5d/week** | | **6-7d/week** | |
| **No. participants** | 10758 | | 2974 | | 2968 | | 9050 | |  |
| **TC (mmol/L)** | 4.95 | 1.02 | 4.90 | 0.97 | 4.81 | 0.97 | 4.76 | 0.93 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | 0.01 (-0.03, 0.05) | | -0.06 (-0.10, -0.02) | | -0.15 (-0.17, -0.12) | | <0.001 |
| Adjusted β (95% CI)2 | Ref. | | 0.01 (-0.03, 0.05) | | -0.05 (-0.09, -0.01) | | -0.13 (-0.16, -0.10) | | <0.001 |
| **TG (mmol/L)** | 1.63 | 1.03 | 1.65 | 1.05 | 1.70 | 1.25 | 1.76 | 1.21 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | 0.003 (-0.04, 0.05) | | 0.06 (0.01, 0.10) | | 0.11 (0.08, 0.14) | | <0.001 |
| Adjusted β (95% CI)2 | Ref. | | 0.001 (-0.05, 0.05) | | 0.05 (0.01, 0.10) | | 0.09 (0.06, 0.12) | | <0.001 |
| **LDL-C (mmol/L)** | 2.93 | 0.84 | 2.89 | 0.83 | 2.83 | 0.81 | 2.88 | 0.81 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | 0.01 (-0.02, 0.04) | | -0.04 (-0.07, -0.004) | | -0.02 (-0.05, 0.01) | | 0.017 |
| Adjusted β (95% CI)2 | Ref. | | 0.01 (-0.02, 0.04) | | -0.03 (-0.07, -0.001) | | -0.02 (-0.04, 0.01) | | 0.059 |
| **HDL-C (mmol/L)** | 1.35 | 0.33 | 1.31 | 0.33 | 1.32 | 0.34 | 1.34 | 0.34 | 0.70 |
| Adjusted β (95% CI)1 | Ref. | | -0.005 (-0.02, 0.01) | | 0.004 (-0.01, 0.02) | | 0.01 (0.001, 0.02) | | 0.021 |
| Adjusted β (95% CI)2 | Ref. | | -0.005 (-0.02, 0.01) | | 0.004 (-0.01, 0.02) | | 0.01 (0.003, 0.02) | | 0.006 |
| **LDL-C/HDL-C (mmol/L)** | 2.30 | 0.80 | 2.31 | 0.82 | 2.26 | 0.82 | 2.25 | 0.78 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | 0.02 (-0.01, 0.05) | | -0.03 (-0.06, 0.003) | | -0.04 (-0.06, -0.02) | | <0.001 |
| Adjusted β (95% CI)2 | Ref. | | 0.02 (-0.01, 0.05) | | -0.03 (-0.06, 0.01) | | -0.04 (-0.06, -0.01) | | <0.001 |
| **Non-HDL-C (mmol/L)** | 3.60 | 1.00 | 3.58 | 0.97 | 3.49 | 0.98 | 3.42 | 0.93 | <0.001 |
| Adjusted β (95% CI)1 | Ref. | | 0.02 (-0.02, 0.05) | | -0.06 (-0.10, -0.03) | | -0.16 (-0.18, -0.13) | | <0.001 |
| Adjusted β (95% CI)2 | Ref. | | 0.02 (-0.02, 0.05) | | -0.06 (-0.09, -0.02) | | -0.14 (-0.17, -0.11) | | <0.001 |

Abbreviations: TC, total cholesterol; TG, triglycerides; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; Non-HDL-C, nonhigh density lipoprotein cholesterol; *CI,* confidence interval, Ref*,* reference, BMI*,* body mass index.

1: Adjusted for age, gender, education level, marital status, smoking status, alcohol drinking, physical activity, BMI and total energy intake.

2: Additionally adjusting for dietary pattern, family history of hyperlipidemia, coronary heart disease and stroke.

**Supplemental Table 3** Multivariate adjusted *OR*s for abnormal lipid levels according to spicy food flavor and spicy food intake frequency after excluding participants with self-reported coronary heart disease and stroke

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **High TC** | **High TG** | **High LDL-C** | **Low HDL-C** | **High Non-HDL-C** |
| **Flavor of spicy food intake (N=34272)** | **OR (95% CI)** | **OR (95% CI)** | **OR (95% CI)** | **OR (95% CI)** | **OR (95% CI)** |
| **No** | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| **Mild** | 0.87 (0.82, 0.91) | 1.06 (1.00, 1.11) | 0.99 (0.94, 1.05) | 0.99 (0.93, 1.06) | 0.87 (0.82, 0.92) |
| **Middle** | 0.81 (0.75, 0.87) | 1.10 (1.03, 1.19) | 0.99 (0.92, 1.08) | 0.99 (0.91, 1.08) | 0.78 (0.72, 0.85) |
| **Heavy** | 0.82 (0.72, 0.94) | 1.22 (1.09, 1.38) | 0.95 (0.83, 1.09) | 1.08 (0.94, 1.25) | 0.72 (0.62, 0.83) |
| **Each level increment\*** | 0.91 (0.88, 0.94) | 1.06 (1.03, 1.09) | 1.00 (0.97, 1.04) | 1.00 (0.97, 1.04) | 0.89 (0.86, 0.92) |
| ***P* for linear trend** | <0.001 | 0.002 | 0.35 | 0.93 | <0.001 |
| **Frequency of spicy food intake (N=25750)** |  |  |  |  |  |
| **Never** | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| **1-2d/week** | 0.98 (0.89, 1.07) | 1.12 (1.02, 1.22) | 1.11 (1.01, 1.22) | 1.01 (0.91, 1.13) | 1.00 (0.91, 1.10) |
| **3-5d/week** | 0.89 (0.81, 0.97) | 1.09 (0.99, 1.19) | 0.98 (0.89, 1.08) | 1.04 (0.93, 1.16) | 0.90 (0.81, 0.99) |
| **6-7d/week** | 0.77 (0.72, 0.82) | 1.17 (1.10, 1.25) | 1.02 (0.95, 1.09) | 0.98 (0.91, 1.07) | 0.74 (0..69, 0.80) |
| **One day increment\*\*** | 0.92 (0.90, 0.94) | 1.05 (1.03, 1.07) | 1.00 (0.98, 1.03) | 0.99 (0.97, 1.02) | 0.91 (0.89, 0.93) |
| ***P* for linear trend** | <0.001 | <0.001 | 0.67 | 0.42 | <0.001 |

Abbreviations: TC, total cholesterol; TG, triglycerides; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; Non-HDL-C, nonhigh density lipoprotein cholesterol; *ORs*, odd ratios; *CI,* confidence interval; Ref*,* reference; BMI*,* body mass index.

Adjusted for age, gender, education level, marital status, smoking status, alcohol drinking, physical activity, BMI and total energy intake.

**\*** Effect estimates of per level increment in spicy flavor levels on abnormal lipid levels.

**\*\*** Effect estimates of per day increment in spicy food intake frequency on abnormal lipid levels.

**Supplemental Table 4** Multivariate adjusted ORs for abnormal lipid levels according to spicy food flavor and spicy food intake frequency after additional adjustment for family history of hyperlipidemia, coronary heart disease and stroke.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **High TC** | **High TG** | **High LDL-C** | **Low HDL-C** | **High Non-HDL-C** |
| **Flavor of spicy food intake (N=34272)** | **OR (95% CI)** | **OR (95% CI)** | **OR (95% CI)** | **OR (95% CI)** | **OR (95% CI)** |
| **No** | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| **Mild** | 0.92 (0.86, 0.97) | 1.09 (1.03, 1.16) | 1.04 (0.97, 1.10) | 0.96 (0.89, 1.04) | 0.93 (0.87, 0.99) |
| **Middle** | 0.85 (0.78, 0.93) | 1.13 (1.04, 1.23) | 1.03 (0.94, 1.13) | 0.93 (0.84, 1.03) | 0.84 (0.76, 0.92) |
| **Heavy** | 0.81 (0.70, 0.93) | 1.25 (1.10, 1.43) | 0.96 (0.82, 1.11) | 1.09 (0.93, 1.28) | 0.71 (0.60, 0.83) |
| **Each level increment\*** | 0.93 (0.89, 0.96) | 1.07 (1.04, 1.11) | 1.01 (0.97, 1.04) | 0.99 (0.95, 1.03) | 0.91 (0.87, 0.94) |
| ***P* for linear trend** | <0.001 | <0.001 | 0.788 | 0.696 | <0.001 |
| **Frequency of spicy food intake (N=25750)** |  |  |  |  |  |
| **Never** | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) | 1.00 (Ref.) |
| **1-2d/week** | 0.99 (0.90, 1.08) | 1.11 (1.01, 1.21) | 1.11 (1.01, 1.23) | 1.01 (0.91, 1.13) | 1.01 (0.92, 1.12) |
| **3-5d/week** | 0.91 (0.83, 0.99) | 1.08 (0.99, 1.19) | 0.99 (0.90, 1.10) | 1.04 (0.93, 1.16) | 0.92 (0.83, 1.01) |
| **6-7d/week** | 0.80 (0.75, 0.85) | 1.14 (1.07, 1.22) | 1.04 (0.97, 1.11) | 0.97 (0.90, 1.05) | 0.77 (0.72, 0.83) |
| **One day increment\*\*** | 0.93 (0.91, 0.95) | 1.04 (1.02, 1.07) | 1.01 (0.99, 1.03) | 0.99 (0.97, 1.02) | 0.92 (0.90, 0.94) |
| ***P* for linear trend** | <0.001 | <0.001 | 0.421 | 0.519 | <0.001 |

Abbreviations: TC, total cholesterol; TG, triglycerides; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol; Non-HDL-C, nonhigh density lipoprotein cholesterol; ORs, odd ratios; CI*,* confidence interval, Ref*,* reference, BMI*,* body mass index.

Adjusted for age, gender, education level, marital status, smoking status, alcohol drinking, physical activity, BMI, total energy intake, dietary pattern, family history of hyperlipidemia, coronary heart disease and stroke.

**\*** Effect estimates of per level increment in spicy flavor levels on abnormal lipid levels.

**\*\*** Effect estimates of per day increment in spicy food intake frequency on abnormal lipid levels.