**Supplemental Table 1.** Comparisons of covariate-adjusted mean of flavonoids

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Improved | | Stable | | Progressed | | %Diﬀ ‡ | *P*-Diff | *P*- trend |
| Mean | SE | Mean | SE | Mean | SE |
| Total flavonoids |  |  |  |  |  |  |  |  |  |
| Model 1§ | 136 | 2.10 | 132 | 1.23 | 130\* | 2.21 | 4.62 | 0.124 | 0.104 |
| Model 2|| | 137 | 1.57 | 132\*\* | 0.96 | 130\*\* | 1.67 | 5.38 | **0.003** | **0.005** |
| Flavanones |  |  |  |  |  |  |  |  |  |
| Model 1§| | 11.07 | 0.43 | 9.63\*\* | 0.25 | 8.83\*\*\* | 0.45 | 25.4 | **0.001** | **0.001** |
| Model 2|| | 10.90 | 0.40 | 9.63\*\* | 0.25 | 8.90\*\* | 0.43 | 22.5 | **0.001** | **0.002** |
| Flavan-3-ols |  |  |  |  |  |  |  |  |  |
| Model 1§ | 10.30 | 0.22 | 10.44 | 0.13 | 10.14 | 0.23 | 1.58 | 0.765 | 0.505 |
| Model 2|| | 10.34 | 0.19 | 10.46 | 0.12 | 10.05 | 0.20 | 2.89 | 0.277 | 0.213 |
| Flavonols |  |  |  |  |  |  |  |  |  |
| Model 1§ | 36.8 | 0.70 | 36.1 | 0.41 | 37.2 | 0.74 | -1.08 | 0.371 | 0.248 |
| Model 2|| | 37.0 | 0.50 | 37.9 | 0.30 | 37.7 | 0.53 | -1.86 | 0.311 | 0.311 |
| Flavones |  |  |  |  |  |  |  |  |  |
| Model 1§ | 4.05 | 0.11 | 3.82 | 0.06 | 3.77 | 0.11 | 7.43 | 0.196 | 0.108 |
| Model 2|| | 4.03 | 0.09 | 3.81\* | 0.06 | 3.80 | 0.10 | 6.05 | 0.080 | 0.102 |
| Isoflavones |  |  |  |  |  |  |  |  |  |
| Model 1§ | 15.6 | 0.53 | 14.0\* | 0.31 | 15.0 | 0.55 | 4.00 | **0.029** | **0.025** |
| Model 2|| | 15.7 | 0.49 | 14.1\*\* | 0.30 | 14.5 | 0.52 | 8.28 | 0.095 | **0.021** |
| Anthocyanins |  |  |  |  |  |  |  |  |  |
| Model 1§ | 58.5 | 1.53 | 56.3 | 0.90 | 55.2 | 0.61 | 5.98 | 0.390 | 0.297 |
| Model 2|| | 59.1 | 1.38 | 56.0 | 0.84 | 55.4\* | 1.46 | 6.68 | **0.044** | 0.108 |

\*, \*\*, \*\*\*: compared with improved group *P* <0.05, *P* <0.01, *P* <0.001; (Bonferroni’s test)

†: compared with stabled group *P* <0.05. (Bonferroni’s test)

‡ %Diff.: percentage difference= (improved group-progressed group)/progressed group× 100%.

§Model 1: adjusted for sex age.

|| Model 2: adjust for sex, age, BMI, household income, alcohol drinking status, smoking status, tea drinking status, physical activities, history of using statins, dietary glycaemic index, dietary intakes of energy, carbohydrate, protein, fat, fiber, vitamin C, polyunsaturated fatty acids and saturated fatty acids.

**Supplemental Table 2.** Comparisons of multivariable-adjusted‡ mean of flavonoids by BMI

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Improved | | Stable | | Progressed | | %Diﬀ § | *P*-Diff | *P*- trend | *P-*Interaction|| |
| Mean | SE | Mean | SE | Mean | SE |
| Total flavonoids |  |  |  |  |  |  |  |  |  |  |
| BMI < 24 | 135 | 2.49 | 131 | 1.19 | 134 | 2.24 | 0.75 | 0.694 | 0.340 | **0.015** |
| BMI ≥ 24 | 139 | 2.11 | 133\* | 1.55 | 126\*\*\*† | 2.59 | 10.3 | **<0.001** | **0.001** |
| Flavanones |  |  |  |  |  |  |  |  |  |  |
| BMI < 24 | 9.82 | 0.59 | 9.50 | 0.28 | 9.24 | 0.53 | 6.28 | 0.463 | 0.764 | **0.001** |
| BMI ≥ 24 | 11.9 | 0.60 | 9.79\*\* | 0.44 | 8.52\*\*\* | 0.74 | 39.7 | **<0.001** | **0.001** |
| Flavan-3-ols |  |  |  |  |  |  |  |  |  |  |
| BMI < 24 | 10.4 | 0.30 | 10.4 | 0.14 | 10.3 | 0.27 | 0.97 | 0.847 | 0.980 | 0.368 |
| BMI ≥ 24 | 10.3 | 0.25 | 10.6 | 0.18 | 9.75† | 0.31 | 5.64 | 0.164 | 0.075 |
| Flavonols |  |  |  |  |  |  |  |  |  |  |
| BMI < 24 | 37.4 | 0.78 | 37.5 | 0.37 | 37.6 | 0.71 | -0.48 | 0.864 | 0.980 | 0.505 |
| BMI ≥ 24 | 36.8 | 0.68 | 38.5 | 0.50 | 38.0 | 0.83 | -3.16 | 0.300 | 0.160 |
| Flavones |  |  |  |  |  |  |  |  |  |  |
| BMI < 24 | 3.78 | 0.15 | 3.76 | 0.07 | 3.79 | 0.14 | -0.26 | 0.879 | 0.975 | **0.047** |
| BMI ≥ 24 | 4.28 | 0.12 | 3.89\*\* | 0.09 | 3.85\* | 0.15 | 11.2 | **0.023** | **0.013** |
| Isoflavones |  |  |  |  |  |  |  |  |  |  |
| BMI < 24 | 15.0 | 0.79 | 14.1 | 0.38 | 14.9 | 0.71 | 0.94 | 0.903 | 0.420 | **0.034** |
| BMI ≥ 24 | 16.4 | 0.63 | 14.1\*\* | 0.47 | 14.3\* | 0.79 | 14.7 | **0.043** | **0.015** |
| Anthocyanins |  |  |  |  |  |  |  |  |  |  |
| BMI < 24 | 58.7 | 2.16 | 56.2 | 1.03 | 57.9 | 1.95 | 1.38 | 0.806 | 0.527 | 0.146 |
| BMI ≥ 24 | 59.0 | 1.89 | 55.7 | 1.39 | 52.1\* | 2.32 | 13.2 | **0.022** | 0.071 |

\*, \*\*, \*\*\*: compared with improved group *P* <0.05, *P* <0.01, *P* <0.001; (Bonferroni’s test)

†: compared with stabled group *P* <0.05. (Bonferroni’s test)

‡ Adjusted covariates: see Supplemental Table 1. Model 2.

§ %Diff.: percentage difference= (improved group-progressed group)/progressed group× 100%.

|| *P-*Interaction：Interaction with BMI (binary variable).

**Supplemental Table 3.** The results of the path coefficients--Regression weights of trimmed model

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  | Estimate | SE | C.R | *P*-value | GFI | AGFI |
| Progress of degree of NAFLD between two examinations | | |  |  |  |  | 0.991 | 0.965 |
| HOMA-IR | <--- | Total flavonoids | -0.038 | 0.017 | -2.276 | 0.023 |  |  |
| Serum cholesterol | <--- | Total flavonoids | -0.016 | 0.004 | -3.573 | \*\*\* |  |  |
| Progress of NAFLD | <--- | HOMA-IR | 0.004 | 0.002 | 2.779 | 0.005 |  |  |
| Progress of NAFLD | <--- | Serum CHO | 0.052 | 0.007 | 2.148 | \*\*\* |  |  |

Abbreviation: GFI, Goodness of Fit Index. AGFI, Adjusted Goodness of Fit Index; NAFLD, non-alcoholic fatty liver disease; HOMA-IR, HOMA insulin resistance index; BMI, body mass index.

\* *P* <0.05, \*\* *P* <0.01, \*\*\* *P* <0.001