**Supplemental Table 1.** Difference in *z scores* of the 33 food groups between dietary patterns (%TE) (Mean values)\*

|  |  |
| --- | --- |
|  | **Dietary Pattern** |
| Food Group (*z score*) |  1 vs 2 | 1 vs 3 |  1 vs 4 | 2 vs 3 |  2 vs 4 |  3 vs 4 |
|   |   |   |   |   |   |   |
| Processed red meat | 0.159 | 0.150 | **0.799** | 0.010 | **0.639** | **0.649** |
| Unprocessed red meat | **0.287** | 0.071 | 0.223 | **0.358** | 0.065 | 0.293 |
| Processed white meat | 0.000 | 0.176 | 0.038 | 0.176 | 0.038 | 0.138 |
| Unprocessed white meat | 0.044 | 0.146 | 0.052 | 0.101 | 0.096 | 0.197 |
|  |  |  |  |  |  |  |
| Alcoholic beverages | **0.438** | **0.430** | 0.092 | 0.008 | **0.347** | **0.338** |
| Biscuits, cakes and pastries | 0.099 | 0.235 | 0.040 | **0.335** | 0.139 | 0.196 |
| Butters, fat spreads & hard cooking fats | 0.097 | 0.198 | **0.888** | 0.101 | **0.985** | **1.086** |
| Cheeses | 0.157 | 0.288 | 0.063 | 0.131 | 0.094 | 0.225 |
| Chips and processed potatoes | **0.337** | **0.380** | **0.335** | 0.043 | 0.002 | 0.045 |
| Confectionary | **0.139** | **0.060** | **0.029** | **0.199** | 0.110 | **0.089** |
| Creams, ice-creams and desserts | **0.203** | 0.016 | **0.237** | 0.187 | 0.034 | 0.222 |
| Egg and egg dishes | **0.203** | 0.031 | **0.274** | 0.234 | 0.071 | **0.305** |
| Fish, fish dishes & products | **0.345** | **0.433** | **0.392** | 0.088 | 0.047 | 0.041 |
| Fruit | **1.210** | **1.178** | **1.088** | 0.032 | 0.122 | 0.090 |
| Fruit juices and smoothies | **0.225** | 0.129 | 0.141 | 0.096 | 0.085 | 0.011 |
| High energy beverages | 0.100 | 0.142 | **0.209** | 0.042 | 0.109 | 0.067 |
| Low energy beverages | **0.155** | 0.077 | 0.114 | 0.078 | 0.041 | 0.037 |
| Low fat & skimmed milks | **0.253** | 0.042 | **0.227** | **0.295** | 0.026 | **0.269** |
| Low fat spreads & oils | 0.066 | 0.122 | **0.214** | 0.056 | **0.280** | **0.336** |
| Other Breakfast Cereals | 0.019 | 0.034 | **0.164** | 0.015 | **0.145** | 0.130 |
| Other milks and milk based beverages | 0.012 | 0.069 | 0.001 | 0.057 | 0.011 | 0.068 |
| Potatoes | 0.178 | 0.121 | **0.432** | 0.058 | **0.610** | **0.552** |
| Rice, pasta, flours and starches | **0.206** | 0.103 | 0.182 | 0.103 | 0.024 | 0.079 |
| Ready to eat breakfast cereals | 0.041 | **0.423** | **0.273** | **0.464** | **0.313** | 0.150 |
| Savouries | **0.235** | 0.141 | 0.116 | 0.094 | 0.119 | 0.025 |
| Savoury snacks | **0.283** | **0.542** | **0.352** | **0.259** | 0.069 | 0.190 |
| Soups, sauces & condiments | 0.232 | 2.186 | 0.242 | 2.418 | 0.010 | 2.427 |
| Sugars, syrups, preserves, sweeteners | 0.053 | 0.161 | **0.494** | 0.108 | **0.546** | **0.655** |
| Vegetables & vegetable dishes | **1.493** | **1.234** | **1.493** | 0.260 | 0.000 | 0.259 |
| White bread, roll, scones, croissants | 0.016 | 0.258 | **1.224** | 0.242 | **1.208** | **0.966** |
| Wholemeal, brown bread & rolls | 0.142 | **0.327** | **0.257** | 0.185 | 0.115 | 0.070 |
| Whole milk | **0.257** | 0.052 | **0.375** | 0.205 | 0.118 | **0.323** |
| Yogurts | 0.104 | 0.173 | 0.078 | 0.069 | 0.026 | 0.095 |
|  |  |  |  |  |  |  |

%TE, percentage of total energy.

\* Bold values indicate a significant difference between patterns, assessed by one-way ANOVA with a Bonferoni correction.

**Supplemental Table 2.** Association between processed red meat consumption and markers of metabolic health (Mean values and standard deviations).

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|   | Non Consumers | Low Consumers  | Medium Consumers  | High Consumers  |   |   |
|  | (*n=*84-120) | (*n=*178-222) | (*n=*162-220) | (*n=*136-220) |   |  |
|  | Mean  | SD | Mean | SD | Mean | SD | Mean  | SD | P\* | P† |
|  |  |  |  |  |  |  |  |  |  |   |
| Processed red meat (g/d) | 0.0a | 0.0 | 11.8b | 4.9 | 30.9c | 6.9 | 80.7d | 39.4 | <0.001 |  |
| **Metabolic Health** |  |  |  |  |  |  |  |  |  |  |
| Glucose (mmol/l) | 5.22 | 0.91 | 5.18 | 0.92 | 5.30 | 1.07 | 5.29 | 0.89 | 0.536 | 1.000 |
| Insulin (µIU/ml) | 13.18 | 24.21 | 11.18 | 13.47 | 12.61 | 13.69 | 12.90 | 17.62 | 0.646 | 1.000 |
| Triglyceride (mmol/l) | 1.13 | 0.63 | 1.21 | 0.75 | 1.38 | 0.84 | 1.34 | 0.83 | 0.012 | 0.850 |
| Total cholesterol (mmol/l) | 5.07 | 1.04 | 5.04 | 1.01 | 4.91 | 1.03 | 4.81 | 0.96 | 0.043 | 1.000 |
| HDL cholesterol(mmol/l) | 1.68 | 0.42 | 1.68 | 0.43 | 1.51 | 0.39 | 1.49 | 0.40 | <0.001 | 0.520 |
| LDL cholesterol (mmol/l) | 2.85 | 0.92 | 2.80 | 0.84 | 2.77 | 0.87 | 2.72 | 0.86 | 0.574 | 1.000 |
| Adiponectin (µg/ml) | 6.99 | 4.09 | 6.82 | 3.47 | 5.57 | 2.70 | 5.53 | 2.67 | <0.001 | 0.560 |
| Leptin (ng/ml) | 7.32 | 9.51 | 5.14 | 5.03 | 5.73 | 7.89 | 3.87 | 3.61 | <0.001 | 0.220 |
| Homocysteine (mmol/l) | 12.25 | 3.42 | 11.80 | 3.24 | 12.06 | 4.02 | 12.97 | 4.52 | 0.012 | 1.000 |
| TNFα (pg/ml) | 7.09 | 3.05 | 6.61 | 2.50 | 6.62 | 1.80 | 7.17 | 2.41 | 0.032 | 1.000 |
|   |   |   |   |   |   |   |   |   |   |   |

*n,* number of participants; TNFα, tumour necrosis factor alpha.

\* Differences in markers of metabolic health across processed red meat consumption groups assessed using a One-Way ANOVA.

† Differences in markers of metabolic health across processed red meat consumption groups assessed using General Linear Model adjusted for age, gender, energy, social class, smoking status, supplement usage and fasting status. Bonferroni correction was applied by multiplying the P-values by the number of traits in the table. P-values that exceeded 1.0 have been marked down to 1.000