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| **Supplementary table 1:** Dietary fibre content of foods listed in the Commonwealth Scientific and Industrial Research Organisation (CSIRO) Food Frequency Questionnaire (FFQ) |
|   | % dietary fibre content |  |   | % dietary fibre content |
| Cereals and grains |   |  |   |   |
| Bran | 27.6 |  | Other bread | 4.2 |
| Wheat germ | 18.6 |  | White bread | 3.9 |
| Muesli | 9.9 |  | Porridge | 3.2 |
| Cereal | 9.1 |  | Noodles | 3.0 |
| Wholemeal bread | 7.1 |  | Pasta | 2.2 |
| High fibre bread | 6.9 |  | Rice | 1.8 |
| Muesli bar | 6.4 |  |   |   |
| Fruits and vegetables |   |  |   |   |
| Dried fruit | 9.8 |  | Onion | 2.5 |
| Broad beans | 7.6 |  | Apricot | 2.5 |
| Peas canned | 7.0 |  | Cabbage | 2.5 |
| Peas | 6.1 |  | Pumpkin | 2.2 |
| Brussel sprouts | 4.7 |  | Turnip, swede | 2.2 |
| Raisins and sultanas | 4.4 |  | Orange | 2.1 |
| Silverbeet, spinach | 4.3 |  | Coleslaw | 2.1 |
| Sweetcorn (fresh) | 4.3 |  | Fruit salad | 2.1 |
| Beetroot | 3.8 |  | Peach | 2.0 |
| Berries | 3.8 |  | Plum | 2.0 |
| Broccoli | 3.8 |  | Nectarine | 2.0 |
| Carrot | 3.7 |  | Capsicum | 2.0 |
| Other fruit | 3.5 |  | Mushrooms fresh | 1.9 |
| Mushrooms canned | 3.4 |  | Packet potato | 1.9 |
| Sweetcorn (canned) | 3.3 |  | Canned fruit | 1.9 |
| Mixed vegetables | 3.3 |  | Boiled potato | 1.8 |
| Hot chips | 3.2 |  | Potato salad | 1.8 |
| Green beans | 3.1 |  | Pineapple | 1.8 |
| Green beans canned | 3.1 |  | Lettuce | 1.7 |
| Avocado | 3.1 |  | Bean sprouts | 1.7 |
| Cauliflower | 3.0 |  | Celery | 1.6 |
| Carrot (canned) | 3.0 |  | Zucchini | 1.4 |
| Grapes | 2.9 |  | Tomato | 1.3 |
| Banana | 2.9 |  | Mashed potato | 1.3 |
| Potato gems | 2.8 |  | Cucumber | 1.2 |
| Roasted potato | 2.7 |  | Gherkin | 1.0 |
| Olives | 2.7 |  | Rockmelon | 1.0 |
| Apple/pear | 2.6 |  |   |   |
| Nuts and legumes |   |  |   |   |
| Nuts | 7.3 |  | Lentils | 6.8 |
| Haricot, lima beans | 7.1 |  | Baked beans | 5.2 |
| Dietary fibre content calculated based on AUSNUT nutrient values  |

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| **Supplementary table 2**: Univariable associations of lifestyle and biological factors with inflammatory markers in adolescents from the Raine Study (n=1239\*)  |
|  | Log hs-CRP |  | Log leptin |  | Adiponectin |
|   | β | 95 % CI | *P* |   | β | 95 % CI | *P* |   | β | 95 % CI | *P* |
| Sex |  |  |  |  |  |  |  |  |  |  |  |
| Female |  |  |  |  |  |  |  |  |  |  |  |
| Male | **-0.25** | **-0.33, -0.18** | **<0.001** |  | **-1.6** | **-1.7, -1.5** | **<0.001** |  | **-3.0** | **-3.6, -2.4** | **<0.001** |
| Energy | **-0.027** | **-0.041, -0.013** | **<0.001** |  | **-0.13** | **-0.15, -0.10** | **<0.001** |  | **-0.21** | **-0.31, -0.10** | **<0.001** |
| Ethnicity |  |  |  |  |  |  |  |  |  |  |  |
| Caucasian |  |  |  |  |  |  |  |  |  |  |  |
| Mixed | -0.068 | -0.20, 0.060 | 0.298 |  | -0.15 | -0.37, 0.065 | 0.170 |  | -0.81 | -1.9, 0.24 | 0.131 |
| Non-Caucasian | **-0.33** | **-0.51, -0.15** | **<0.001** |  | -0.12 | -0.41, 0.17 | 0.416 |  | **-1.6** | **-3.0, -0.17** | **0.028** |
| Screentime (hr/weekend day) |  |  |  |  |  |  |  |  |  |  |  |
| <2 |  |  |  |  |  |  |  |  |  |  |  |
| 2-4 | -0.076 | -0.18, 0.025 | 0.141 |  | -0.063 | -0.23, 0.11 | 0.467 |  | -0.036 | -0.90, 0.83 | 0.934 |
| >4 | -0.080 | -0.19, 0.025 | 0.136 |  | -0.072 | -0.25, 0.11 | 0.425 |  | **-1.3** | **-2.2, -0.38** | **0.005** |
| Physical activity (hr/week) |  |  |  |  |  |  |  |  |  |  |  |
| ≤1 |  |  |  |  |  |  |  |  |  |  |  |
| 2-3 | -0.062 | -0.17, 0.043 | 0.249 |  | **-0.23** | **-0.40, -0.063** | **0.007** |  | -0.72 | -1.6, 0.19 | 0.120 |
| 4-6 | -0.020 | -0.14, 0.097 | 0.733 |  | **-0.53** | **-0.72, -0.33** | **<0.001** |  | -0.76 | -1.8, 0.26 | 0.145 |
|  >7 | **-0.25** | **-0.38, -0.11** | **<0.001** |  | **-0.93** | **-1.1, -0.71** | **<0.001** |  | **-1.4** | **-2.6, -0.27** | **0.016** |
| Smoking (cigarettes/day) |  |  |  |  |  |  |  |  |  |  |  |
| ≤1 |  |  |  |  |  |  |  |  |  |  |  |
| 1-5 | 0.16 | -0.00049, 0.32 | 0.051 |  | 0.14 | -0.13, 0.41 | 0.322 |  | -0.14 | -1.6, 1.3 | 0.847 |
| >5 | **0.28** | **0.13, 0.42** | **<0.001** |  | **0.31** | **0.063, 0.55** | **0.014** |  | -0.45 | -1.7, 0.83 | 0.493 |
| Alcohol (standard drinks/week) |  |  |  |  |  |  |  |  |  |  |  |
| 0 |  |  |  |  |  |  |  |  |  |  |  |
| 0.1-5 | -0.035 | -0.15, 0.085 | 0.568 |  | -0.030 | -0.23, 0.17 | 0.772 |  | -0.38 | -1.4, 0.67 | 0.478 |
| 5.1-10 | **0.13** | **0.011, 0.25** | **0.033** |  | 0.18 | -0.024, 0.39 | 0.082 |  | 0.74 | -0.32, 1.8 | 0.172 |
| >10 | **0.18** | **0.075, 0.28** | **0.001** |  | -0.13 | -0.31, 0.049 | 0.156 |  | -0.15 | -1.1, 0.76 | 0.746 |
| Dietary misreporting |  |  |  |  |  |  |  |  |  |  |  |
| Plausible  |  |  |  |  |  |  |  |  |  |  |  |
| Under | **0.26** | **0.16, 0.36** | **<0.001** |  | **0.82** | **0.67, 0.97** | **<0.001** |  | **0.86** | **0.11, 1.6** | **0.024** |
| Over | -0.0041 | -0.17, 0.16 | 0.961 |  | **-0.65** | **-0.91, -0.39** | **<0.001** |  | -1.0 | -2.3, 0.20 | 0.100 |
| BMI | **0.064** | **0.055, 0.072** | **<0.001** |  | **0.13** | **0.12, 0.15** | **<0.001** |  | **-0.23** | **-0.31, -0.15** | **<0.001** |
| Waist/height ratio | **3.9** | **3.3, 4.5** | **<0.001** |  | **9.2** | **8.3, 10** | **<0.001** |  | **-13.9** | **-19, -8.4** | **<0.001** |
| hs-CRP, high sensitivity C-reactive protein\*29 participants with hs-CRP>10mg/L were excluded |
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| **Supplementary table 3:** Sensitivity analysis of weighted associations between dietary fibre intake and inflammatory markers in plausible dietary reporters only\*  |
|  | Log hs-CRP |  | Log leptin |  | Adiponectin |
|   | β | 95% CI | *P* |   | β | 95% CI | *P* |   | β | 95% CI | *P* |
| Dietary fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | 0.021 | -0.014, 0.057 | 0.249 |  | -0.029 | -0.092, 0.034 | 0.373 |  | -0.26 | -0.57, 0.044 | 0.093 |
| Model 2 | 0.024 | -0.012, 0.060 | 0.190 |  | 0.0076 | -0.035, 0.050 | 0.724 |  | -0.18 | -0.47, 0.10 | 0.208 |
| Model 3 | 0.020 | -0.018, 0.059 | 0.296 |  | -0.020 | -0.055, 0.014 | 0.250 |  | -0.16 | -0.48, 0.17 | 0.339 |
| Model 4 | **0.044** | **0.0039, 0.083** | **0.031** |  | -0.0069 | -0.044, 0.030 | 0.713 |  | -0.32 | -0.67, 0.021 | 0.066 |
| Cereal and grain fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | -0.033 | -0.093, 0.028 | 0.286 |  | **-0.21** | **-0.32, -0.11** | **<0.001** |  | **-0.66** | **-1.17, -0.16** | **0.010** |
| Model 2 | -0.021 | -0.083, 0.041 | 0.507 |  | -0.044 | -0.12, 0.027 | 0.225 |  | -0.31 | -0.80, 0.18 | 0.212 |
| Model 3 | -0.042 | -0.11, 0.021 | 0.187 |  | **-0.095** | **-0.15, -0.039** | **<0.001** |  | -0.26 | -0.79, 0.27 | 0.333 |
| Model 4 | -0.021 | -0.085, 0.043 | 0.520 |  | **-0.081** | **-0.14, -0.024** | **0.006** |  | -0.42 | -0.97, 0.13 | 0.136 |
| Fruit and vegetable fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | 0.051 | -0.0049, 0.11 | 0.074 |  | 0.049 | -0.049, 0.15 | 0.327 |  | -0.27 | -0.75, 0.20 | 0.256 |
| Model 2 | 0.049 | -0.0062, 0.10 | 0.082 |  | 0.024 | -0.041, 0.089 | 0.473 |  | -0.33 | -0.77, 0.11 | 0.145 |
| Model 3 | 0.043 | -0.011, 0.097 | 0.119 |  | -0.0069 | -0.056, 0.042 | 0.784 |  | -0.28 | -0.74, 0.17 | 0.224 |
| Model 4 | **0.063** | **0.0097, 0.12** | **0.021** |  | 0.0071 | -0.043, 0.057 | 0.781 |  | -0.39 | -0.86, 0.082 | 0.105 |
| hs-CRP, high sensitivity C-reactive proteinModel 1 - dietary fibre (per 5g/day higher intake) |
| Model 2 - Model 1 + sex |
| Model 3 - Model 2 + waist height ratio, body mass index, and energy intake |
| Model 4 - Model 3 + ethnicity, screentime, physical activity, smoking, and alcohol intake |
| Weighted by inverse probability of having complete data and being included in the study |
| \*Plausible reporting as determined by the Goldberg method |

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| **Supplementary table 4:** Weighted associations between dietary fibre intake and inflammatory markers measured at 17 years of age in males from the Raine Study |
|  | Log hs-CRP |  | Log leptin |  | Adiponectin |
|   | β | 95% CI | *P* |   | β | 95% CI | *P* |   | β | 95% CI | *P* |
| Dietary fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | 0.010 | -0.022, 0.042 | 0.540 |  | **-0.040** | **-0.080, -0.00013** | **0.049** |  | -0.21 | -0.44, 0.018 | 0.071 |
| Model 2 | 0.017 | -0.024, 0.058 | 0.410 |  | -0.024 | -0.060, 0.013 | 0.207 |  | -0.17 | -0.48, 0.14 | 0.274 |
| Model 3 | 0.022 | -0.019, 0.063 | 0.288 |  | -0.016 | -0.054, 0.021 | 0.398 |  | -0.25 | -0.56, 0.072 | 0.129 |
| Cereal and grain fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | -0.013 | -0.070, 0.043 | 0.642 |  | **-0.098** | **-0.17, -0.029** | **0.005** |  | -0.27 | -0.67, 0.13 | 0.179 |
| Model 2 | -0.019 | -0.083, 0.045 | 0.556 |  | **-0.088** | **-0.15, -0.031** | **0.002** |  | -0.14 | -0.62, 0.35 | 0.582 |
| Model 3 | -0.016 | -0.081, 0.049 | 0.622 |  | **-0.080** | **-0.14, -0.021** | **0.007** |  | -0.12 | -0.62, 0.38 | 0.630 |
| Fruit and vegetable fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | 0.038 | -0.017, 0.093 | 0.177 |  | -0.022 | -0.091, 0.047 | 0.531 |  | **-0.43** | **-0.83, -0.037** | **0.032** |
| Model 2 | 0.041 | -0.017, 0.098 | 0.167 |  | -0.018 | -0.069, 0.034 | 0.507 |  | -0.33 | -0.77, 0.10 | 0.131 |
| Model 3 | 0.042 | -0.015, 0.099 | 0.146 |  | -0.0076 | -0.060, 0.045 | 0.776 |  | -0.37 | -0.81, 0.070 | 0.099 |
| hs-CRP, high sensitivity C-reactive proteinModel 1 - dietary fibre (per 5g/day higher intake) |
| Model 2 – Model 1 + waist height ratio, body mass index, energy intake, and dietary misreporting |
| Model 3 – Model 2 + ethnicity, screen time, physical activity, smoking, and alcohol intake |
| Weighted by inverse probability of having complete data and being included in the study |
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| **Supplementary table 5:** Weighted associations between dietary fibre intake and inflammatory markers measured at 17 years of age in females from the Raine Study |
|  | Log hs-CRP |  | Log leptin |  | Adiponectin |
|   | β | 95% CI | *P* |   | β | 95% CI | *P* |   | β | 95% CI | *P* |
| Dietary fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | **-0.048** | **-0.088, -0.0077** | **0.019** |  | -0.025 | -0.065, 0.014 | 0.214 |  | 0.0070 | -0.35, 0.36 | 0.969 |
| Model 2 | -0.033 | -0.077, 0.012 | 0.150 |  | -0.017 | -0.053, 0.019 | 0.366 |  | -0.016 | -0.44, 0.41 | 0.941 |
| Model 3 | 0.011 | -0.032, 0.054 | 0.617 |  | -0.012 | -0.050, 0.027 | 0.548 |  | 0.001 | -0.45, 0.45 | 0.998 |
| Cereal and grain fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | -0.068 | -0.14, 0.0067 | 0.075 |  | -0.018 | -0.092, 0.055 | 0.622 |  | -0.28 | -0.93, 0.37 | 0.392 |
| Model 2 | -0.048 | -0.12, 0.028 | 0.217 |  | -0.024 | -0.086, 0.037 | 0.431 |  | -0.40 | -1.1, 0.31 | 0.271 |
| Model 3 | -0.028 | -0.098, 0.042 | 0.438 |  | -0.024 | -0.087, 0.038 | 0.447 |  | -0.33 | -1.1, 0.40 | 0.369 |
| Fruit and vegetable fibre |  |  |  |  |  |  |  |  |  |  |  |
| Model 1 | -0.029 | -0.092, 0.034 | 0.375 |  | -0.0044 | -0.067, 0.058 | 0.890 |  | -0.082 | -0.64, 0.47 | 0.772 |
| Model 2 | -0.018 | -0.078, 0.043 | 0.570 |  | -0.0036 | -0.053, 0.045 | 0.885 |  | -0.045 | -0.62, 0.53 | 0.877 |
| Model 3 | 0.041 | -0.015, 0.098 | 0.154 |  | 0.00083 | -0.050, 0.052 | 0.975 |  | -0.074 | -0.67, 0.52 | 0.806 |
| hs-CRP, high sensitivity C-reactive proteinModel 1 - dietary fibre (per 5g/day higher intake) |
| Model 2 – Model 1 + waist height ratio, body mass index, energy intake, and dietary misreporting |
| Model 3 – Model 2 + ethnicity, screen time, physical activity, smoking, alcohol intake, and oral contraceptive usage |
| Weighted by inverse probability of having complete data and being included in the study |
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