**Table S1. Unit changes and Standardized β coefficients of three adiposity indicators associated with per 10% increase of calories from UPF or MPF – NHANES 2011-2016 (n=12,297)**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **SADHtR** | **WHtR** | **BMI** |
| **Unit change (se)** |  |  |  |
| UPF | 0.0025 (0.0004) | 0.0082 (0.0014) | 0.5247 (0.0995) |
| MPF | -0.0024 (0.0004) | -0.0078 (0.0016) | -0.4561 (0.1079) |
| **Standardized β coefficients (se)** |  |  |  |
| UPF | 0.0926 (0.0148) | 0.0846 (0.0147) | 0.0791 (0.0150) |
| MPF | -0.0901 (0.0162) | -0.0806 (0.0162) | -0.0688 (0.0163) |

MPF: unprocessed- or minimally-processed foods; NHANES: National Health and Nutrition Examination Survey; SADHtR: supine sagittal abdominal diameter to height ratio; WHtR: WC to height ratio; UPF: ultra-processed foods.

**Table S2. Weighted means (se) for anthropometry, demographic and clinical characteristics of included participants compared to all participants with completed first 24-hr dietary recall – NHANES 2011-2016**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Included participants(n=12,297) | All participants with complete first 24-hr dietary recall(n=14,865) | P value |
| **Anthropometry** |  |  |  |
| SAD, cm | 22.6 (0.10) | 22.7 (0.09) | 0.771 |
| WC, cm | 99.2 (0.33) | 99.5 (0.31) |  0.496 |
| Height, cm | 168.4 (0.17) | 168.4 (0.17) | 0.517 |
| Weight, kg | 82.3 (0.38) |  82.7 (0.34) | 0.784 |
| SADHtR |  0.1346 (0.0006) | 0.1346 (0.0006) | 0.495 |
| WHtR | 0.5903 (0.0021) | 0.5916 (0.0020) | 0.673 |
| BMI, kg/m2 | 28.9 (0.14) |  29.1 (0.12) | 0.861 |
| **Age,** yr | 47.8 (0.40) | 47.7 (0.39) |  0.429 |
| **Male, %** | 48.0 (0.54) | 48.4 (0.49) | 0.708 |
| **Race-Hispanic origin**, % |  |  |  |
| Non-Hispanic white |  66.2 (2.04) | 65.5 (2.10) | 0.406 |
| Non-Hispanic black | 10.6 (1.08) | 11.3 (1.07) | 0.518 |
| Non-Hispanic Asian | 5.7 (0.62) |  5.5 (0.58) | 0.407 |
| Hispanic | 14.5 (1.40) | 14.7 (1.45) | 0.540 |
| Other | 3.0 (0.29) | 3.0 (0.26) | 0.500 |
| **Education**, % |  |  |  |
| Below high school completion |  14.0 (0.98) | 14.9 (0.95) | 0.745 |
| High school graduate | 20.3 (0.75) | 21.1 (0.79) |  0.769 |
| College or above | 65.7 (1.44) |  64.0 (1.41) |  0.199 |
| **Smoking status**, % |  |  |  |
| Current |  18.7 (0.68) | 19.3 (0.62) | 0.743 |
| Former | 2.1 (0.23) | 2.2 (0.20) |  0.629 |
| Never | 79.2 (0.70) |  77.8 (0.65) | 0.071 |
| **Physical activity**, % |  |  |  |
| Poor |  43.3 (1.13) | 45.0 (1.20) | 0.849 |
| Intermediate | 16.3 (0.50) | 15.7 (0.50) | 0.198 |
| Ideal | 40.5 (1.00) | 39.2 (1.03) | 0.183 |
| **Awareness of diagnosed diabetes**, % | 10.0 (0.40) | 10.2 (0.37) | 0.643 |

BMI: body mass index; SAD: supine sagittal abdominal diameter; SADHtR: supine sagittal abdominal diameter to height ratio; WC: waist circumference; WHtR: WC to height ratio.

**Table S3. Odds ratios and 95% confidence intervals for adiposity indicators associated with UPF including participants with implausible energy intake, NHANES 2011-2016 (n=13,712)**1

|  |  |  |
| --- | --- | --- |
|  | **Quartiles of usual percent of calories from UPF** |  |
|  | **Q1** | **Q2** | **Q3** | **Q4** | **P-value**3 |
| **Midpoint and range of usual percentage of calories from UPF** | 40.3 (25.9-46.4) | 50.9 (46.5-55.0) | 59.2 (55.1-63.7) | 70.0 (63.8-85.4) |  |
| **SADHtR** |  |  |  |  |  |
| Age, sex and race-Hispanic origin adjusted |  |  |  |  |  |
| T2 | 1.00 | 1.23 (1.13-1.34) | 1.44 (1.25-1.67) | 1.78 (1.42-2.25) | <0.001 |
| T3 | 1.00 | 1.57 (1.44-1.71) | 2.22 (1.91-2.59) | 3.51 (2.77-4.47) | <0.001 |
| Fully adjusted2 |  |  |  |  |  |
| T2 | 1.00 | 1.12 (1.04-1.21) | 1.22 (1.07-1.40) | 1.37 (1.11-1.71) | 0.005 |
| T3 | 1.00 | 1.30 (1.21-1.40) | 1.59 (1.39-1.82) | 2.08 (1.68-2.57) | <0.001 |
| **WHtR** |  |  |  |  |  |
| Age, sex and race-Hispanic origin adjusted |  |  |  |  |  |
| T2 | 1.00 | 1.23 (1.14-1.32) | 1.43 (1.26-1.63) | 1.76 (1.44-2.17) | <0.001 |
| T3 | 1.00 | 1.51 (1.37-1.67) | 2.08 (1.75-2.48) | 3.17 (2.41-4.78) | <0.001 |
| Fully adjusted2 |  |  |  |  |  |
| T2 | 1.00 | 1.14 (1.05-1.23) | 1.25 (1.09-1.44) | 1.43 (1.15-1.78) | 0.002 |
| T3 | 1.00 | 1.28 (1.16-1.41) | 1.55 (1.31-1.84) | 1.99 (1.52-2.62) |  < 0.001 |
| **BMI** |  |  |  |  |  |
| Age, sex and race-Hispanic origin adjusted |  |  |  |  |  |
| T2 | 1.00 | 1.10 (1.02-1.18) | 1.18 (1.04-1.35) | 1.30 (1.07-1.60) | 0.012 |
| T3 | 1.00 | 1.40 (1.28-1.53) | 1.82 (1.55-2.13) | 2.56 (1.99-3.29) | <0.001 |
| Fully adjusted2 |  |  |  |  |  |
| T2 | 1.00 | 1.05 (0.97-1.14) | 1.09 (0.95-1.26) | 1.15 (0.93-1.43) | 0.193 |
| T3 | 1.00 | 1.26 (1.15-1.38) | 1.50 (1.28-1.77) | 1.90 (1.47-2.46) | <0.001 |

1 BMI: body mass index; NHANES: National Health and Nutrition Examination Survey; SADHtR: supine sagittal abdominal diameter to height ratio; T2: second tertile; T3: third tertile; WHtR: waist circumference to height ratio; UPF: ultra-processed foods.

2 Adjusted for age as categorical variable, sex, race-Hispanic origin, education, smoking status, physical activity, and awareness of diabetes.

3 *P*-value of beta-coefficient for percentage of calories (continuous) from UPF in the multinomial logistic regression models.

**Table S4. Odds ratios and 95% confidence intervals for adiposity indicators associated with MPF including participants with implausible energy intake, NHANES 2011-2016 (n=13,712)**1

|  |  |  |
| --- | --- | --- |
|  | **Quartiles of usual percent of calories from MPF** |  |
|  | **Q1** | **Q2** | **Q3** | **Q4** | **P-value**3 |
| **Midpoint and range of usual percentage of calories from MPF** | 17.8 (9.2-22.1) |  25.6 (22.2-28.9) | 32.5 (29.0-36.7) | 42.6 (36.8-58.9) |  |
| **SADHtR** |  |  |  |  |  |
| Age, sex and race-Hispanic origin adjusted |  |  |  |  |  |
| T2 | 1.00 | 0.84 (0.79-0.89) | 0.71 (0.64-0.80) | 0.57 (0.47-0.69) | <0.001 |
| T3 | 1.00 | 0.73 (0.67-0.79) | 0.55 (0.48-0.64) | 0.37 (0.29-0.47) | <0.001 |
| Fully adjusted2 |  |  |  |  |  |
| T2 | 1.00 | 0.89 (0.83-0.95) | 0.80 (0.70-0.91) | 0.68 (0.55-0.85) | 0.001 |
| T3 | 1.00 |  0.82 (0.76-0.88) | 0.69 (0.60-0.78) | 0.53 (0.43-0.66) | <0.001 |
| **WHtR** |  |  |  |  |  |
| Age, sex and race-Hispanic origin adjusted |  |  |  |  |  |
| T2 | 1.00 | 0.84 (0.79-0.90) | 0.72 (0.64-0.81) | 0.57 (0.47-0.71) | <0.001 |
| T3 | 1.00 | 0.76 (0.69-0.82) | 0.59 (0.50-0.70) | 0.41 (0.31-0.54) | <0.001 |
| Fully adjusted2 |  |  |  |  |  |
| T2 | 1.00 | 0.88 (0.82-0.84) | 0.78 (0.69-0.90) | 0.66 (0.53-0.84) | <0.001 |
| T3 | 1.00 | 0.83 (0.77-0.90) | 0.71 (0.61-0.82) | 0.56 (0.43-0.71) | <0.001 |
| **BMI** |  |  |  |  |  |
| Age, sex and race-Hispanic origin adjusted |  |  |  |  |  |
| T2 | 1.00 | 0.94 (0.88-1.01) | 0.89 (0.78-1.02) | 0.82 (0.66-1.03) | 0.084 |
| T3 | 1.00 | 0.83 (0.77-0.89) | 0.70 (0.60-0.81) | 0.55 (0.43-0.70) | <0.001 |
| Fully adjusted2 |  |  |  |  |  |
| T2 | 1.00 |  0.95 (0.88-1.02) | 0.90 (0.78-1.04) | 0.84 (0.66-1.07) | 0.156 |
| T3 | 1.00 | 0.86 (0.80-0.92) | 0.75 (0.65-0.85) | 0.61 (0.49-0.77) | <0.001 |

1 BMI: body mass index; NHANES: National Health and Nutrition Examination Survey; SADHtR: supine sagittal abdominal diameter to height ratio; T2: second tertile; T3: third tertile; WHtR: waist circumference to height ratio; MPF: ultra-processed foods.

2 Adjusted for age as categorical variable, sex, race-Hispanic origin, education, smoking status, physical activity, and awareness of diabetes.

3 *P*-value of beta-coefficient for percentage of calories (continuous) from MPF in the multinomial logistic regression models.