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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 1a** Energy and nutrient intake by the frequency of meals including staple, main, and side dishes by age group (male participants) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | 6–11 years | | | | | | |  | 12–17 years | | | | | | |  | 18–40 years | | | | | | |  | 41–64 years | | | | | | |  | ≥65 years | | | | | | |
| Frequency of SMS meals\*\*\* | | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |
|  |  | (n=206) | | (n=543) | | (n=167) | |  |  | (n=220) | | (n=534) | | (n=222) | |  |  | (n=1,300) | | (n = 1,462) | | (n = 446) | |  |  | (n = 1,700) | | (n = 2,451) | | (n = 991) | |  |  | (n = 1,173) | | (n = 1,785) | | (n = 1,284) | |  |
|  |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |
| Energy\* | (MJ) | 6.9 | (6.7, 7.1) | 7.8 | (7.7, 7.9) | 8.0 | (7.7, 8.2) | <0.001 |  | 9.0 | (8.6, 9.3) | 10.4 | (10.2, 10.6) | 11.0 | (10.7, 11.4) | <0.001 |  | 8.0 | (7.9, 8.2) | 9.4 | (9.3, 9.5) | 10.3 | (10.1, 10.5) | <0.001 |  | 8.2 | (8.1, 8.3) | 9.3 | (9.2, 9.4) | 10.0 | (9.9, 10.2) | <0.001 |  | 7.4 | (7.3, 7.5) | 8.5 | (8.4, 8.6) | 9.4 | (9.3, 9.5) | <0.001 |
| Energy percent | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Protein\* | (%E) | 14.1 | (13.7, 14.4) | 14.6 | (14.4, 14.8) | 14.9 | 14.6, 15.3) | <0.001 |  | 14.0 | (13.7, 14.4) | 14.2 | (14.0, 14.4) | 14.5 | (14.2, 14.8) | 0.051 |  | 13.8 | (13.6, 13.9) | 14.0 | (13.9, 13.2) | 13.6 | (14.3, 14.9) | <0.001 |  | 14.2 | (14.1, 14.3) | 14.2 | (14.1, 14.3) | 14.8 | (14.6, 15.0) | <0.001 |  | 14.2 | (14.1, 14.4) | 14.8 | (14.6, 14.9) | 15.3 | (15.2, 15.5) | <0.001 |
| Fat\* | (%E) | 28.3 | (27.5, 29.1) | 29.0 | (28.5, 29.5) | 27.5 | (26.6, 28.4) | 0.280 |  | 27.6 | (26.7, 28.4) | 28.6 | (28.1, 29.2) | 27.9 | (27.1, 28.7) | 0.759 |  | 26.5 | (26.1, 26.9) | 26.9 | (26.5, 27.2) | 26.7 | (26.0, 27.4) | 0.394 |  | 24.5 | (24.1, 24.8) | 24.5 | (24.2, 24.8) | 24.6 | (24.2, 25.1) | 0.845 |  | 21.0 | (20.7, 21.4) | 22.2 | (21.9, 22.5) | 22.2 | (21.8, 22.5) | <0.001 |
| Saturated fatty acid\* | (%E) | 9.5 | (9.2, 9.8) | 9.5 | (9.3, 9.7) | 8.7 | (8.3, 9.1) | 0.004 |  | 8.4 | (8.1, 8.7) | 8.6 | (8.4, 8.8) | 8.1 | (7.8, 8.4) | 0.227 |  | 7.1 | (7.0, 7.3) | 7.1 | (7.0, 7.3) | 6.9 | (6.7, 7.2) | 0.183 |  | 6.4 | (6.3, 6.5) | 6.3 | (6.2, 6.4) | 6.2 | (6.0, 6.3) | 0.002 |  | 5.6 | (5.5, 5.7) | 5.7 | (5.6, 5.8) | 5.6 | (5.4, 5.7) | 0.415 |
| Carbohydrate\* | (%E) | 56.2 | (55.3, 57.1) | 55.0 | (54.5, 55.6) | 56.2 | (55.2, 57.2) | 0.849 |  | 56.4 | (55.4, 57.3) | 55.2 | (54.6, 55.8) | 55.8 | (54.9, 56.7) | 0.493 |  | 55.0 | (54.6, 55.5) | 55.2 | (54.8, 55.7) | 55.3 | (54.5, 56.1) | 0.434 |  | 53.0 | (52.5, 53.4) | 55.0 | (54.6, 55.4) | 55.3 | (54.8, 55.9) | <0.001 |  | 58.0 | (57.5, 58.6) | 57.9 | (57.5, 58.3) | 58.5 | (58.0, 59.0) | 0.175 |
| Dietary fiber\*\* | (g/day) | 11.6 | (11.0, 12.2) | 12.9 | (12.6, 13.3) | 14.6 | (13.9, 15.2) | <0.001 |  | 14.2 | (13.4, 14.9) | 16.1 | (15.6, 16.5) | 18.4 | (17.7, 19.1) | <0.001 |  | 16.2 | (15.8, 16.6) | 17.8 | (17.4, 18.1) | 20.4 | (19.7, 21.0) | <0.001 |  | 17.1 | (16.7, 17.4) | 18.4 | (18.1, 18.7) | 20.9 | (20.4, 21.4) | <0.001 |  | 16.6 | (16.2, 17.0) | 18.8 | (18.4, 19.1) | 20.8 | (20.4, 21.2) | <0.001 |
| Vitamin A\*\* | (μgRAE/day) | 480 | (440, 520) | 548 | (523, 572) | 580 | (536, 625) | 0.001 |  | 628 | (547, 709) | 693 | (641, 744) | 764 | (684, 844) | 0.024 |  | 612 | (555, 668) | 674 | (621, 727) | 764 | (668, 860) | 0.006 |  | 585 | (523, 608) | 660 | (623, 697) | 767 | (710, 823) | <0.001 |  | 538 | (494, 582) | 635 | (599, 670) | 717 | (674, 759) | <0.001 |
| Vitamin B1\* | (mg/4184 kJ) | 0.45 | (0.42, 0.47) | 0.47 | (0.45. 0.49) | 0.48 | (0.45, 0.51) | 0.131 |  | 0.45 | (0.42, 0.47)) | 0.45 | (0.44, 0.47) | 0.46 | (0.44, 0.49) | 0.410 |  | 0.47 | (0.45, 0.49) | 0.46 | (0.44, 0.48) | 0.47 | (0.44, 0.50) | 0.526 |  | 0.46 | (0.44, 0.47) | 0.45 | (0.44, 0.47) | 0.46 | (0.44, 0.48) | 0.748 |  | 0.45 | (0.43, 0.47) | 0.47 | (0.46, 0.49) | 0.46 | (0.44, 0.48) | 0.651 |
| Vitamin B2\* | (mg/4184 kJ) | 0.69 | (0.66, 0.72) | 0.68 | (0.66, 0.70) | 0.66 | (0.62, 0.69) | 0.177 |  | 0.59 | (0.56, 0.62) | 0.60 | (0.58, 0.62) | 0.58 | (0.55, 0.61) | 0.667 |  | 0.58 | (0.56, 0.60) | 0.54 | (0.52, 0.56) | 0.57 | (0.53, 0.61) | 0.185 |  | 0.60 | (0.58, 0.61) | 0.57 | (0.56, 0.58) | 0.58 | (0.57, 0.60) | 0.232 |  | 0.63 | (0.61, 0.65) | 0.65 | (0.63, 0.66) | 0.64 | (0.62, 0.66) | 0.460 |
| Niacin\* | (mgNE/4184 kJ) | 5.7 | (5.4, 6.0) | 6.2 | (6.0, 6.3) | 6.4 | (6.1, 6.7) | 0.002 |  | 6.2 | (5.9, 6.6) | 6.3 | (6.1, 6.5) | 6.6 | (6.3, 6.9) | 0.114 |  | 7.5 | (7.3, 7.7) | 7.4 | (7.2, 7.6) | 7.6 | (7.3, 7.9) | 0.889 |  | 8.3 | (8.1, 8.5) | 8.0 | (7.9, 8.2) | 8.0 | (7.8, 8.2) | 0.044 |  | 8.0 | (7.8, 8.2) | 8.2 | (8.1, 8.4) | 8.4 | (8.2, 8.6) | 0.003 |
| Vitamin B6\*\* | (mg/day) | 0.93 | (0.86, 0.99) | 1.03 | (1.00, 1.07) | 1.09 | (1.02, 1.15) | <0.001 |  | 1.29 | (1.21, 1.38) | 1.39 | (1.33, 1.44) | 1.52 | (1.44, 1.61) | <0.001 |  | 1.54 | (1.46, 1.63) | 1.63 | (1.55, 1.71) | 1.78 | (1.63, 1.93) | 0.009 |  | 1.56 | (1.51, 1.61) | 1.62 | (1.58, 1.67) | 1.70 | (1.64, 1.76) | <0.001 |  | 1.42 | (1.36, 1.48) | 1.57 | (1.52, 1.62) | 1.58 | (1.52, 1.64) | <0.001 |
| Vitamin B12\*\* | (μg/day) | 5.0 | (4.3, 5.8) | 5.3 | (4.8, 5.8) | 5.5 | (4.7, 6.4) | 0.363 |  | 7.0 | (6.1, 7.8) | 6.7 | (6.1, 7.2) | 7.5 | (6.7, 8.4) | 0.406 |  | 7.8 | (7.3, 8.3) | 7.3 | (6.8, 7.8) | 8.0 | (7.2, 8.9) | 0.923 |  | 9.2 | 88.7, 9.7) | 8.8 | (8.4, 9.2) | 9.4 | (8.8, 10.1) | 0.591 |  | 8.4 | (7.9, 8.9) | 8.8 | (8.4, 9.2) | 9.0 | (8.6, 9.5) | 0.024 |
| Folate\*\* | (μg/day) | 203 | (192, 214) | 232 | (225, 239) | 250 | (238, 263) | <0.001 |  | 263 | (247, 280) | 300 | (290, 311) | 342 | (326, 359) | <0.001 |  | 328 | (318, 339) | 345 | (335, 355) | 401 | (383, 419) | <0.001 |  | 355 | (347, 364) | 373 | (365, 381) | 429 | (417, 441) | <0.001 |  | 338 | (328, 347) | 377 | (369, 384) | 425 | (416, 434) | <0.001 |
| Vitamin C\*\* | (mg/day) | 63 | (57, 70) | 70 | (66, 73) | 78 | (71, 85) | 0.003 |  | 71 | (64, 79) | 89 | (84, 94) | 107 | (99, 115) | <0.001 |  | 86 | (81, 91) | 97 | (93, 101) | 121 | (113, 128) | <0.001 |  | 101 | (97, 105) | 113 | (110, 117) | 130 | (125, 135) | <0.001 |  | 118 | (112, 123) | 137 | (132, 141) | 153 | (147, 158) | <0.001 |
| Ca\*\* | (mg/day) | 643 | (611, 675) | 670 | (650, 689) | 678 | (643, 714) | 0.119 |  | 671 | (631, 711) | 698 | (673, 724) | 727 | (687, 766) | 0.051 |  | 582 | (566, 599) | 572 | (557, 588) | 624 | (196, 652) | 0.072 |  | 601 | (588, 616) | 591 | (579, 603) | 643 | (624, 661) | 0.003 |  | 552 | (535, 567) | 598 | (585, 611) | 645 | (629, 660) | <0.001 |
| Mg\*\* | (mg/day) | 201 | (193, 209) | 222 | (217, 227) | 239 | (230, 248) | <0.001 |  | 267 | (257, 277) | 278 | (272, 285) | 302 | (292, 311) | <0.001 |  | 302 | (297, 308) | 310 | (305, 315) | 343 | (334, 352) | <0.001 |  | 326 | (321, 331) | 323 | (319, 327) | 352 | (346, 359) | <0.001 |  | 286 | (281, 291) | 307 | (302, 311) | 326 | (321, 331) | <0.001 |
| Fe\*\* | (mg/day) | 5.8 | (5.5, 6.1) | 6.4 | (6.2, 6.5) | 7.0 | (6.7, 7.3) | <0.001 |  | 8.2 | (7.9, 8.6) | 8.8 | (8.6, 9.0) | 9.5 | (9.1, 9.8) | <0.001 |  | 9.5 | (9.3, 9.7) | 9.8 | (9.6, 10.0) | 11.1 | (10.9, 11.5) | <0.001 |  | 9.8 | (9.7, 10.0) | 10 | (9.9, 10.2) | 11.2 | (11.0, 11.5) | <0.001 |  | 8.6 | (8.4, 8.8) | 9.5 | (9.3, 9.6) | 10.4 | (10.2, 10.6) | <0.001 |
| Zn\*\* | (mg/day) | 7.6 | (7.4, 7.9) | 8.4 | (8.2, 8.5) | 8.6 | (8.3, 9.0) | <0.001 |  | 11.3 | (11.0, 11.7) | 12.0 | (11.7, 12.2) | 12.3 | (11.9, 12.7) | 0.001 |  | 11.4 | (11.2, 11.6) | 12.1 | (11.9, 12.3) | 12.9 | (12.6, 13.3) | <0.001 |  | 10.7 | (10.5, 10.8) | 11.1 | (11.0, 11.3) | 12.0 | (11.8, 12.2) | <0.001 |  | 8.8 | (8.7, 9.0) | 9.4 | (9.3, 9.6) | 9.9 | (9.8, 10.1) | <0.001 |
| Cu\*\* | (mg/day) | 0.96 | (0.92, 1.00) | 1.04 | (1.02, 1.06) | 1.16 | (1.12, 1.20) | <0.001 |  | 1.42 | (1.37, 1.47) | 1.46 | (1.42, 1.49) | 1.59 | (1.54, 1.64) | <0.001 |  | 1.52 | (1.49, 1.54) | 1.60 | (1.58, 1.63) | 1.75 | (1.70, 1.79) | <0.001 |  | 1.50 | (1.47, 1.53) | 1.59 | (1.56, 1.61) | 1.75 | (1.71, 1.79) | <0.001 |  | 1.35 | (1.33, 1.38) | 1.43 | (1.41, 1.45) | 1.6 | (1.53, 1.58) | <0.001 |
| Salt\*\* | (g/day) | 8.0 | (7.6, 8.4) | 8.6 | (8.3, 8.9) | 9.4 | (9.0, 9.9) | <0.001 |  | 11.8 | (11.3, 12.4) | 11.5 | (11.2, 11.9) | 12.5 | (12.0, 13.0) | 0.044 |  | 14.9 | (14.6, 15.2) | 14.0 | (13.7, 14.2) | 14.4 | (13.9, 14.9) | 0.003 |  | 14.6 | (14.3, 14.8) | 13.9 | (13.7, 14.1) | 15.2 | (14.8, 15.5) | 0.026 |  | 12.3 | (12.0, 12.6) | 12.5 | (12.3, 12.8) | 13.0 | (12.8, 13.3) | <0.001 |
| \*Expressed as the adjusted mean and 95% confidence intervals (95% CI), | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| using a mixed effects model with 8 regions in Japan (Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu) and age as the random effects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \*\*Expressed as the adjusted mean and 95% confidence intervals (95% CI), | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| using a mixed effects model with 9 regions in Japan (Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu), age, and estimated energy intake as the random effects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \*\*\* An SMS meal was defined as a combination of staple, main, and side dishes. The frequency of SMS meals was classified as once or less than once a day, twice a day, or three times or more a day. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RAE: retinol equivalent; NE: Niacin equivalent; (%E): percentage of energy intake from each nutrient | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 1b** Energy and nutrient intake by the frequency of meals including staple, main, side dishes by age group (female participants) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | 6–11 years (n=939) | | | | | | |  | 12–17 years (n=843) | | | | | | |  | 18–40 years (n=3,199) | | | | | | |  | 41–64 years (n=5,721) | | | | | | |  | ≥65 years | | | | | | |
| Frequency of SMS meals\*\*\* | | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |
|  |  | (n = 232) | | (n = 560) | | (n = 147) | |  |  | (n = 214) | | (n = 449) | | (n = 180) | |  |  | (n = 1,574) | | (n = 1,257) | | (n = 368) | |  |  | (n = 2,331) | | (n = 2,441) | | (n = 949) | |  |  | (n = 1,705) | | (n = 2,263) | | (n = 1,315) | |  |
|  |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |
| Energy\* | (MJ) | 6.3 | (6.2, 6.5) | 7.1 | (7.0, 7.2) | 7.5 | (7.3, 7.7) | <0.001 |  | 7.2 | (7.0, 7.5) | 8.2 | (8.0, 8.4) | 8.8 | (8.6, 9.1) | <0.001 |  | 6.3 | (6.2, 6.4) | 7.3 | (7.2, 7.4) | 8.0 | (7.8, 8.2) | <0.001 |  | 6.5 | (6.4, 6.6) | 7.5 | (7.4, 7.5) | 8.1 | (8.0, 8.2) | <0.001 |  | 5.9 | (5.9, 6.0) | 7.0 | (7.0, 7.1) | 7.7 | (7.6, 7.8) | <0.001 |
| Energy percent | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Protein\* | (%E) | 14.2 | (13.9, 14.5) | 14.7 | (14.5, 14.9) | 15.1 | (14.7, 15.4) | <0.001 |  | 14.2 | (13.9, 14.5) | 14.8 | (14.6, 15.0) | 14.9 | (14.5, 15.2) | 0.004 |  | 14.4 | (14.2, 14.6) | 14.8 | (14.6, 15.0) | 15.3 | (14.9, 15.6) | <0.001 |  | 14.7 | (14.5, 14.8) | 15.1 | (15.0, 15.2) | 15.6 | (15.4, 15.8) | <0.001 |  | 14.8 | (14.7, 15.0) | 15.3 | (15.2, 15.4) | 16.1 | (15.9, 16.3) | <0.001 |
| Fat\* | (%E) | 29.1 | (28.4, 29.9) | 29.3 | (28.8, 29.8) | 28.5 | (27.6, 29.4) | 0.473 |  | 30.0 | (29.1, 30.8) | 29.5 | (29.9, 30.1) | 28.5 | (27.6, 29.4) | 0.012 |  | 28.7 | (28.3, 29.0) | 28.4 | (28.0, 29.8) | 27.7 | (26.9, 28.5) | 0.024 |  | 28.5 | (26.2, 26.8) | 26.8 | (26.5, 27.1) | 26.4 | (26.0, 26.9) | 0.726 |  | 22.6 | (22.3, 23..0) | 23.5 | (23.2, 23.8) | 23.4 | (23.1, 23.8) | 0.002 |
| Saturated fatty acid\* | (%E) | 9.5 | (9.2, 9.9) | 9.7 | (9.5, 9.9) | 9.1 | (8.8, 9.5) | 0.228 |  | 9.1 | (8.7, 9.4) | 8.9 | (8.7, 9.1) | 8.5 | (8.1, 8.8) | 0.017 |  | 8.0 | (7.9, 8.2) | 7.8 | (7.6, 7.9) | 7.3 | (7.0, 7.6) | <0.001 |  | 7.2 | (7.1, 7.3) | 7.2 | (7.1, 7.3) | 6.8 | (6.6, 7.0) | <0.001 |  | 6.0 | (5.9, 6.1) | 6.1 | (6.0, 6.2) | 5.9 | (5.8, 6.0) | 0.141 |
| Carbohydrate\* | (%E) | 55.3 | (54.5, 56.1) | 54.7 | (54.1, 55.2) | 55.2 | (54.1, 56.2) | 0.570 |  | 54.2 | (53.3, 55.2) | 54.1 | (53.5, 54.7) | 55.0 | (54.0, 56.0) | 0.245 |  | 54.3 | (53.9, 54.8) | 54.6 | (54.2, 55.1) | 55.2 | (54.3, 56.1) | 0.058 |  | 56.1 | (55.8, 56.5) | 56.1 | (55.7, 56.4) | 56.2 | (55.6, 56.7) | 0.649 |  | 60.9 | (60.5, 61.3) | 60.0 | (59.6, 60.3) | 59.4 | (59.0, 59.9) | <0.001 |
| Dietary fiber\*\* | (g/day) | 11.7 | (11.2, 12.2) | 12.2 | (11.9, 12.5) | 14.2 | (13.6, 14.8) | <0.001 |  | 14.2 | (13.6, 14.9) | 15.9 | (15.4, 16.4) | 17.2 | (16.4, 17.9) | <0.001 |  | 14.4 | (14.1, 14.7) | 15.4 | (15.0, 15.7) | 17.0 | (16.3, 17.6) | <0.001 |  | 16.6 | (16.3, 16.9) | 17.4 | (17.1, 17.6) | 18.6 | (18.2, 19.1) | <0.001 |  | 16.5 | (16.2, 16.8) | 17.5 | (17.3, 17.8) | 19.1 | (18.7, 19.4) | <0.001 |
| Vitamin A\*\* | (μgRAE/day) | 515 | (478, 553) | 517 | (493, 541) | 541 | (494, 588) | 0.495 |  | 574 | (509, 638) | 659 | (615, 704) | 666 | (596, 736) | 0.049 |  | 562 | (523, 600) | 600 | (557, 634) | 659 | (580, 739) | 0.021 |  | 552 | (526, 578) | 617 | (592, 643) | 649 | (608, 689) | <0.001 |  | 558 | (528, 589) | 599 | (573., 626) | 669 | (638, 704) | <0.001 |
| Vitamin B1\* | (mg/4184 kJ) | 0.44 | (0.42, 0.45) | 0.46 | (0.45, 0.48) | 0.49 | (0.47, 0.51) | <0.001 |  | 0.45 | (0.43, 0.47) | 0.46 | (0.44, 0.47) | 0.47 | (0.45, 0.50) | 0.362 |  | 0.51 | (0.48, 0.53) | 0.47 | (0.44, 0.50) | 0.47 | (0.41, 0.52) | 0.107 |  | 0.49 | (0.48, 0.50) | 0.47 | (0.46, 0.48) | 0.48 | (0.46, 0.50) | 0.478 |  | 0.49 | (0.47, 0.52) | 0.48 | (0.46, 0.50) | 0.50 | 0.48, 0.53) | 0.623 |
| Vitamin B2\* | (mg/4184 kJ) | 0.65 | (0.62, 0.67) | 0.68 | (0.67, 0.70) | 0.68 | (0.65, 0.71) | 0.068 |  | 0.61 | (0.58, 0.63) | 0.62 | (0.60, 0.64) | 0.61 | (0.58, 0.64) | 0.653 |  | 0.66 | (0.64, 0.69) | 0.60 | (0.57, 0.63) | 0.62 | (0.57, 0.67) | 0.011 |  | 0.66 | (0.64, 067) | 0.64 | (0.63, 0.66) | 0.66 | (0.64, 0.68) | 0.751 |  | 0.72 | (0.70, 0.74) | 0.69 | (0.67, 0.71) | 0.71 | (0.69, 0.74) | 0.533 |
| Niacin\* | (mgNE/4184 kJ) | 5.9 | (5.6, 6.2) | 6.1 | (5.9, 6.3) | 6.7 | (6.4, 7.1) | <0.001 |  | 6.2 | (5.9, 6.5) | 6.5 | (6.3, 6.7) | 6.5 | (6.2, 6.9) | 0.148 |  | 7.6 | (7.4, 7.8) | 7.7 | (7.5, 7.9) | 8.0 | (7.6, 8.3) | 0.168 |  | 8.3 | (8.1, 8.4) | 8.3 | (8.1, 8.4) | 8.3 | (8.1, 8.6) | 0.418 |  | 8.1 | (7.9, 8.3) | 8.1 | (8.0, 8.3) | 8.7 | (8.5, 8.9) | <0.001 |
| Vitamin B6\*\* | (mg/day) | 0.94 | (0.87, 1.00) | 0.95 | (0.91, 0.99) | 1.08 | (1.00, 1.16) | 0.017 |  | 1.18 | (1.11, 1.24) | 1.25 | (1.20, 1.29) | 1.28 | (1.21, 1.35) | 0.064 |  | 1.24 | (1.18, 1.31) | 1.22 | (1.15, 1.29) | 1.30 | (1.17, 1.43) | 0.619 |  | 1.29 | (1.25, 1.32) | 1.31 | (1.28, 1.35) | 1.37 | (1.32, 1.42) | 0.004 |  | 1.25 | (1.21, 1.29) | 1.28 | (1.24, 1.31) | 1.35 | (1.30, 1.39) | 0.001 |
| Vitamin B12\*\* | (μg/day) | 4.5 | (3.9, 5.0) | 4.9 | (4.6, 5.2) | 5.5 | (4.8, 6.1) | 0.017 |  | 5.8 | (4.9, 6.7) | 6.8 | (6.2, 7.5) | 7.1 | (6.1, 8.1) | 0.024 |  | 5.6 | (5.3, 5.9) | 5.7 | (5.4, 6.1) | 6.3 | (5.6, 6.9) | 0.057 |  | 6.2 | (5.9, 6.5) | 6.6 | (6.4, 6.9) | 7.0 | (6.6, 7.5) | <0.001 |  | 6.6 | (6.2, 6.9) | 7.0 | (6.7, 7.3) | 7.7 | (7.3, 8.1) | <0.001 |
| Folate\*\* | (μg/day) | 209 | (199, 218) | 219 | (213, 225) | 251 | (238, 263) | <0.001 |  | 266 | (252, 281) | 300 | (290, 310) | 316 | (300, 332) | <0.001 |  | 287 | (280, 295) | 297 | (289, 306) | 337 | (322, 353) | <0.001 |  | 327 | (321, 333) | 345 | (339, 351) | 376 | (367, 386) | <0.001 |  | 334 | (327, 341) | 354 | (348, 360) | 388 | (380, 396) | <0.001 |
| Vitamin C\*\* | (mg/day) | 64 | (58, 69) | 68 | (65, 72) | 80 | (73, 88) | <0.001 |  | 80 | (71, 89) | 91 | (84, 97) | 99 | (89, 109) | 0.012 |  | 89 | (85, 93) | 93 | (88, 97) | 106 | (98, 114) | <0.001 |  | 113 | (109, 116) | 117 | (114, 121) | 128 | (122, 133) | <0.001 |  | 129 | (125, 133) | 137 | (133, 140) | 147 | (143, 152) | <0.001 |
| Ca\*\* | (mg/day) | 593 | (567, 618) | 636 | (619, 652) | 654 | (622, 686) | 0.002 |  | 623 | (589, 657) | 681 | (658, 705) | 700 | (663, 737) | <0.001 |  | 512 | (499, 525) | 508 | (494, 523) | 540 | (514, 566) | 0.126 |  | 558 | (547, 568) | 561 | (551, 571) | 588 | (572, 605) | 0.002 |  | 537 | (525, 550) | 566 | (555, 576) | 600 | (587, 614) | <0.001 |
| Mg\*\* | (mg/day) | 197 | (190, 205) | 207 | (202, 211) | 229 | (220, 238) | <0.001 |  | 247 | (237, 256) | 264 | (258, 271) | 279 | (269, 289) | <0.001 |  | 245 | (240, 249) | 251 | (246, 256) | 272 | (263, 260) | <0.001 |  | 279 | (275, 282) | 290 | (277, 284) | 295 | (289, 300) | <0.001 |  | 259 | (256, 263) | 271 | (268, 275) | 287 | (283, 292) | <0.001 |
| Fe\*\* | (mg/day) | 5.7 | (5.5, 6.0) | 6.1 | (5.9, 6.2) | 6.8 | (6.5, 7.1) | <0.001 |  | 7.7 | (7.4, 8.0) | 8.2 | (8.0, 8.4) | 8.9 | (8.6, 9.2) | <0.001 |  | 7.7 | (7.6, 7.9) | 8.0 | (7.9, 8.2) | 8.9 | (8.6, 9.2) | <0.001 |  | 8.4 | (8.3, 8.5) | 8.8 | (8.7, 8.9) | 9.5 | (9.3, 9.7) | <0.001 |  | 8.0 | (7.9, 8.2) | 8.5 | (8.4, 8.6) | 9.2 | (9.1, 0.4) | <0.001 |
| Zn\*\* | (mg/day) | 7.4 | (7.1, 7.6) | 7.8 | (7.6, 7.9) | 8.1 | (7.8, 8.4) | 0.001 |  | 9.7 | (9.3, 10.0) | 10.5 | (10.3, 10.7) | 10.6 | (10.3, 11.0) | <0.001 |  | 8.3 | (8.2, 8.5) | 8.9 | (8.8, 9.0), | 9.3 | (9.0, 9.5) | <0.001 |  | 8.3 | (8.2, 8.4) | 8.8 | (8.7, 8.9) | 9.2 | (9.0, 9.3) | <0.001 |  | 7.4 | (7.3, 7.5) | 7.9 | (7.8, 8.0) | 8.2 | (8.1, 8.4) | <0.001 |
| Cu\*\* | (mg/day) | 0.94 | (0.90, 0.97) | 0.97 | (0.95, 0.99) | 1.06 | (1.02, 1.11) | <0.001 |  | 1.22 | (1.18, 1.26) | 1.30 | (11.27, 1.33) | 1.39 | (1.35, 1.44) | <0.001 |  | 1.15 | (1.13, 1.17) | 1.21 | (1.19, 1.23) | 1.32 | (1.29, 1.36) | <0.001 |  | 1.23 | (1.21, 1.24) | 1.30 | (1.28, 1.31) | 1.4 | (1.36, 1.41) | <0.001 |  | 1.18 | (1.17, 1.20) | 1.25 | (1.23, 1.26) | 1.32 | (1.30, 1.33) | <0.001 |
| Salt\*\* | (g/day) | 8.2 | (7.8, 8.5) | 8.0 | (7.8, 8.2) | 8.8 | (8.4, 9.3) | 0.053 |  | 10.8 | (10.3, 11.3) | 11.1 | (10.8, 11.5) | 11.7 | (11.2, 12.3) | 0.018 |  | 11.2 | (11.0, 11.4) | 10.8 | (10.6, 11.1) | 11.2 | (10.7, 11.6) | 0.472 |  | 11.6 | (11.4, 11.8) | 11.6 | (11.5, 11.8) | 11.8 | (11.6, 12.1) | 0.064 |  | 10.8 | (10.6, 11.0) | 10.9 | (10.7, 11.0) | 11.4 | (11.2, 11.7) | <0.001 |
| \*Expressed as the adjusted mean and 95% confidence intervals (95% CI), | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| using a mixed effects model with 8 regions in Japan (Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu) and age as the random effects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \*\*Expressed as the adjusted mean and 95% confidence intervals (95% CI), | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| using a mixed effects model with 8 regions in Japan (Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu), age, and estimated energy intake as the random effects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \*\*\* An SMS meal was defined as a combination of staple, main, and side dishes. The frequency of SMS meals was classified as once or less than once a day, twice a day, or three times or more a day. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RAE: retinol equivalent; NE: Niacin equivalent; (%E): percentage of energy intake from each nutrient | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 2a** Food intake from each food group by the frequency of meals including staple, main, and side dishes by age group (male participants) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | 6–11 years | | | | | | |  | 12–17 years | | | | | | |  | 18–40 years | | | | | | |  | 41–64 years | | | | | | |  | ≥65 years | | | | | | |
| Frequency of SMS meal\* | | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |
|  |  | (n = 206) | | (n = 543) | | (n = 167) | |  |  | (n = 220) | | (n = 534) | | (n = 222) | |  |  | (n = 1,300) | | (n = 1,462) | | (n = 446) | |  |  | (n = 1,700) | | (n = 2,451) | | (n.= 991) | |  |  | (n = 1,173) | | (n = 1,785) | | (n = 1,284) | |  |
|  |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |
| Cereals | (g/day) | 421.5 | (403.0, 440.1) | 414.0 | (402.7, 425.4) | 433.5 | (412.9, 454.1) | 0.540 |  | 714.2 | (689.1, 741.3) | 677.1 | (659.8, 694.3) | 685.6 | (658.7, 712.4) | 0.178 |  | 762.5 | (748.4, 776.6) | 746.5 | (733.3, 759.8) | 761.6 | (737.6, 785.7) | 0.512 |  | 653.0 | (641.9, 664.0) | 678.0 | (668.4, 687.6) | 704.2 | (689.6, 718.8) | <0.001 |  | 569.6 | (557.4, 581.9) | 547.8 | (537.9, 557.8) | 562.3 | (550.6, 574.1) | 0.556 |
| Potatoes | (g/day) | 48.9 | (41.7, 56.2) | 59.3 | (54.9, 63.8) | 75.0 | (67.0, 83.0) | <0.001 |  | 52.0 | (41.8, 62.1) | 73.2 | (66.7, 76.7) | 93.9 | (83.9, 104.0) | <0.001 |  | 57.8 | (52.9, 62.7) | 72.6 | (68.0, 77.3) | 82.9 | (74.6, 91.3) | <0.001 |  | 60.0 | (56.0, 64.1) | 69.4 | (65.9, 73.0) | 82.7 | (77.3, 88.0) | <0.001 |  | 56.0 | (51.2, 60.7) | 71.9 | (68.0, 75.7) | 79.9 | (75.3, 84.4) | <0.001 |
| Sugar | (g/day) | 4.3 | (3.5, 5.2) | 5.9 | (5.4, 6.5) | 4.7 | (3.8, 5.7) | 0.441 |  | 6.8 | (5.7, 7.9) | 6.5 | (5.8, 7.2) | 6.9 | (5.8, 8.0) | 0.911 |  | 6.7 | (6.2, 7.2) | 7.6 | (7.1, 8.1) | 6.8 | (5.9, 7.7) | 0.305 |  | 8.0 | (7.5, 8.4) | 7.9 | (7.5, 8.3) | 8.3 | (7.7, 8.9) | 0.823 |  | 7.9 | (7.3, 8.5) | 8.6 | (8.1, 9.1) | 8.1 | (7.5, 8.6) | 0.806 |
| Beans | (g/day) | 37.2 | (30.2, 44.2) | 47.8 | (43.5, 52.1) | 60.4 | (52.6, 68.2) | <0.001 |  | 48.3 | (39.7, 56.9) | 52.5 | (47.0, 58.0) | 66.5 | 57.9, 75.0) | 0.003 |  | 66.6 | (60.5, 72.7) | 68.5 | (62.8, 74.2) | 87.9 | (77.5, 98.2) | 0.003 |  | 80.3 | (75.2, 85.4) | 76.0 | (71.5, 80.5) | 97.7 | (90.9, 104.5) | <0.001 |  | 71.2 | (66.1, 76.3) | 77.7 | (73.6, 81.8) | 92.3 | (87.4, 97.1) | <0.001 |
| Seeds | (g/day) | 2.0 | (1.3, 2.5) | 1.6 | (1.2, 2.0) | 1.5 | (0.8, 2.2) | 0.295 |  | 1.9 | (1.0, 2.8) | 1.6 | (1.1, 2.2) | 1.4 | (0.5, 2.4) | 0.447 |  | 1.4 | (1.1, 1.8) | 1.5 | (1.2, 1.8) | 2.0 | (1.4, 2.6) | 0.184 |  | 2.8 | (2.3, 3.3) | 2.8 | (2.3, 3.2) | 2.4 | (1.7, 3.1) | 0.426 |  | 2.3 | (1.6, 2.9) | 2.6 | (2.1, 3.1) | 3.4 | (2.7, 4.0) | 0.008 |
| Vegetables | (g/day) | 181.2 | (165.0, 197.4) | 233.2 | (223.3, 243.1) | 295.5 | (277.6, 313.5) | <0.001 |  | 214.0 | (192.5, 235.6) | 306.1 | (292.3, 319.9) | 398.0 | (376.6, 419.3) | <0.001 |  | 292.8 | (280.8, 304.8) | 372.8 | (361.5, 384.1) | 447.5 | (427.0, 468.1) | <0.001 |  | 303.8 | (293.4, 314.2) | 378.3 | (369.2, 387.3) | 464.2 | (450.5, 477.9) | <0.001 |  | 284.0 | (272.2, 295.7) | 362.2 | (352.8, 371.7) | 423.1 | (411.8, 434.3) | <0.001 |
| Fruits | (g/day) | 94.8 | (78.8, 110.8) | 88.8 | (79.1, 98.6) | 100.2 | (82.5, 118.0) | 0.579 |  | 92.0 | (72.7, 111.2) | 96.8 | (84.5, 109.1) | 93.1 | (74.0, 112.1) | 0.885 |  | 60.2 | (52.4, 68.1) | 70.0 | (62.3, 77.2) | 94.2 | (80.7, 107.6) | <0.001 |  | 96.1 | (89.1, 103.2) | 100.6 | (94.5, 106.7) | 101.1 | (91.8, 110.3) | 0.435 |  | 145.2 | (135.8, 154.6) | 164.9 | (157.3, 172.5) | 162.5 | (153.5, 171.6) | 0.013 |
| Mushrooms | (g/day) | 13.4 | (10.4, 16.3) | 13.8 | (12.0, 15.6) | 15.7 | (12.5, 19.0) | 0.190 |  | 13.4 | (9.8, 17.1) | 15.7 | (13.4, 18.1) | 21.4 | (17.8, 25.1) | 0.002 |  | 18.4 | (16.0, 20.8) | 23.0 | (20.7, 25.2) | 25.9 | (21.8, 29.9) | <0.001 |  | 19.5 | (17.5, 21.5) | 24.0 | (22.2, 25.7) | 27.6 | (25.0, 30.2) | <0.001 |  | 17.4 | (15.3, 19.6) | 22.9 | (21.1, 24.6) | 26.3 | (24.2, 28.3) | <0.001 |
| Seaweeds | (g/day) | 5.5 | (3.4, 7.5) | 8.4 | (7.1, 9.6) | 8.2 | (6.0, 10.5) | 0.056 |  | 7.4 | (2.9, 11.9) | 9.6 | (6.7, 12.5) | 16.7 | (12.2, 21.2) | 0.003 |  | 8.0 | (6.7, 9.3) | 12.8 | (11.6, 14.0) | 16.0 | (13.8, 18.2) | <0.001 |  | 12.3 | (11.0, 13.6) | 13.8 | (12.6, 14.9) | 16.0 | (14.3, 17.7) | 0.001 |  | 12.3 | (10.8, 13.8) | 13.8 | (12.6, 15.1) | 15.4 | (13.9, 16.8) | 0.003 |
| Fish | (g/day) | 47.7 | (40.3, 55.1) | 51.4 | (46.9, 55.9) | 58.5 | (50.3, 66.7) | 0.041 |  | 67.9 | (58.3, 77.5) | 67.4 | (61.3, 73.5) | 75.7 | (66.2, 85.1) | 0.199 |  | 83.3 | (77.8, 88.9) | 91.6 | (88.4, 96.9) | 100.9 | (91.4, 110.4) | 0.001 |  | 112.5 | (107.4, 117.6) | 108.4 | (103.9, 112.8) | 122.0 | (115.2, 128.8) | 0.028 |  | 106.5 | (101.3, 111.8) | 110.2 | (106.0, 114.5) | 120.6 | (114.6, 124.7) | <0.001 |
| Meat | (g/day) | 78.8 | (70.8, 86.8) | 95.3 | (90.4, 100.2) | 89.8 | (81.0, 98.7) | 0.048 |  | 149.6 | (136.8, 162.5) | 167.0 | (158.8, 175.2) | 160.1 | (147.4, 172.8) | 0.298 |  | 160.9 | (154.7, 167.1) | 174.4 | (168.6, 180.2) | 175.9 | (165.3, 186.5) | 0.003 |  | 121.4 | (117.0, 125.9) | 130.3 | (126.4, 134.1) | 132.0 | (126.1, 137.8) | 0.008 |  | 65.1 | (61.3, 69.0) | 76.8 | (73.7, 80.0) | 81.5 | (77.8, 85.2) | <0.001 |
| Eggs | (g/day) | 31.0 | (26.4, 35.6) | 27.6 | (24.7, 30.4) | 32.6 | (27.4, 37.7) | 0.740 |  | 49.0 | (42.7, 55.3) | 52.6 | (48.6, 56.7) | 57.3 | (51.0, 63.6) | 0.097 |  | 46.2 | (43.4, 49.1) | 50.6 | (47.9, 53.2) | 62.4 | (57.6, 67.2) | <0.001 |  | 45.6 | (43.3, 47.8) | 47.8 | (45.8, 49.7) | 58.9 | (56.0, 61.9) | <0.001 |  | 33.5 | (31.3, 35.6) | 39.4 | (37.6, 41.1) | 41.7 | (39.6, 43.8) | <0.001 |
| Milk | (g/day) | 332.1 | (308.3, 355.8) | 333.0 | (318.5, 347.6) | 305.0 | (278.7, 331.4) | 0.201 |  | 265.,2 | (236.0, 294.4) | 274.0 | (255.4, 292.7) | 262.6 | (233.6, 291.6) | 0.824 |  | 102.3 | (92.3, 112.3) | 106.3 | (96.9, 115.7) | 102.3 | (85.2, 119.4) | 0.796 |  | 98.1 | (90.4, 105.9) | 96.6 | (89.8, 103.3) | 87.7 | (77.5, 97.9) | 0.164 |  | 116.7 | (108.5, 124.9) | 115.5 | (108.8, 122.1) | 109.2 | (101.3, 117.0) | 0.151 |
| Oils | (g/day) | 9.0 | (8.0, 10.0) | 9.2 | (8.6, 9.8) | 8.8 | (7.7, 9.9) | 0.890 |  | 15.1 | (13.7, 16.5) | 15.1 | (14.2, 16.0) | 15.5 | (14.1, 16.9) | 0.829 |  | 16.8 | (16.1, 17.5) | 18.4 | (17.7, 19.1) | 16.7 | (15.5, 18.0) | 0.392 |  | 14.1 | (13.6, 14.7) | 15.1 | (14.6, 15.6) | 14.3 | (13.6, 15.1) | 0.535 |  | 8.9 | (8,4, 9.4) | 9.0 | (8.6, 9.4) | 8.4 | (8.0, 8.9) | 0.172 |
| Sweets | (g/day) | 42.4 | (35.9, 48.8) | 33.7 | (29.8, 37.7) | 33.2 | (26.0, 40.3) | 0.042 |  | 38.5 | (30.9, 46.0) | 35.5 | (30.6, 40.3) | 27.7 | (20.2, 35.2) | 0.044 |  | 28.3 | (25.3, 31.4) | 24.4 | (21.5, 27.3) | 20.2 | (14.9, 25.4) | 0.007 |  | 22.6 | (20.4, 24.7) | 20.3 | (18.5, 22.1) | 16.0 | (13.2, 18.8) | <0.001 |  | 21.8 | (19.4, 24.1) | 21.6 | (18.7, 23.5) | 21.5 | (19.3, 23.7) | 0.932 |
| Luxury drinks | (g/day) | 1.8 | (1.3, 2.2) | 2.6 | (2.3, 2.9) | 2.3 | (1.7, 2.9) | 0.140 |  | 2.1 | (0.7, 3.6) | 3.9 | (3.0, 4.8) | 4.3 | (2.9, 5.7) | 0.038 |  | 230.6 | (208.0, 253.3) | 151.3 | (130.0, 172.6) | 121.1 | (82.5, 159.8) | <0.001 |  | 409.6 | (387.8, 431.4) | 280.3 | (261.4, 299.2) | 215.4 | (186.7, 244.2) | <0.001 |  | 238.0 | (221.3, 254.7) | 173.9 | (160.4, 187.4) | 132.0 | (116.0, 148.0) | <0.001 |
| Seasonings | (g/day) | 60.9 | (51,9, 70.0) | 70.6 | (65.1, 76.1) | 74.6 | (64.6, 84.7) | 0.060 |  | 109.7 | (98.1, 121.5) | 84.3 | (76.8, 91.8) | 103.7 | (92.0, 115.3) | 0.511 |  | 159.3 | (150.7, 167.9) | 137.7 | (129.6, 145.8) | 131.9 | (117.2, 146.6) | <0.001 |  | 153.6 | (147.0, 160.3) | 129.5 | (123.7, 135.3) | 132.4 | (123.6, 141.2) | <0.001 |  | 109 | (102.9, 115.1) | 106.4 | (101.5, 111.4) | 106.3 | (100.5, 112.2) | 0.555 |
| Food intake from each food group is expressed as the adjusted mean and 95% confidence intervals (95% CI), | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| using a mixed effects model with 9 regions in Japan (Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu) and age as the random effects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \*An SMS meal was defined as a combination of staple, main, and side dishes. The frequency of SMS meals was classified as once or less than once a day, twice a day, and three times or more a day. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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| **Table 2b** Food intake from each food group by the frequency of meals including staple, main, and side dishes by age group (female participants) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|  |  | 6–11 years | | | | | | |  | 12–17 years | | | | | | |  | 18–40 years | | | | | | |  | 41–64 years | | | | | | |  | ≥65 years | | | | | | |
| Frequency of SMS meal\* | | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |  | ≤1 | | 2 | | ≥3 | |  |
|  |  | (n = 232) | | (n = 560) | | (n = 147) | |  |  | (n = 214) | | (n = 449) | | (n = 180) | |  |  | (n = 1,574) | | (n = 1,257) | | (n = 368) | |  |  | (n = 2,331) | | (n = 2,441) | | (n = 949) | |  |  | (n = 1,705) | | (n = 2,263) | | (n = 1,315) | |  |
|  |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |  | mean | (95% CI) | mean | (95% CI) | mean | (95% CI) | p for trend |
| Cereals | (g/day) | 381.6 | (466.0, 397.2) | 370.7 | (360.7, 380.6) | 387.9 | (368.3, 407.4) | 0.949 |  | 517.9 | (495.5, 540.3) | 537.2 | (521.8, 552.5) | 564,9 | (540.6, 589.2) | 0.006 |  | 461.4 | (452.7, 470.1) | 485.8 | (476.0, 495.5) | 489.7 | (471.6, 507.8) | <0.001 |  | 455.5 | (448.4, 462.6) | 470.3 | (463.4, 477.2) | 474.1 | (463.0, 485.3) | <0.001 |  | 443.7 | (436.0, 451.4) | 418.7 | (412.0, 425.4) | 418.9 | (410.2, 427.7) | <0.001 |
| Potatoes | (g/day) | 52.9 | (46.4, 59.4) | 54.2 | (50.1, 58.4) | 76.7 | (68.5, 84.8) | <0.001 |  | 63.7 | (54.2, 73.1) | 68.9 | (62.4, 75.3) | 76.7 | (66.4, 86.9) | 0.040 |  | 54.0 | (50.3, 57.6) | 62.6 | (58.5, 66.6) | 69.4 | (61.9, 77.0) | <0.001 |  | 58.6 | (55.6, 61.7) | 63.2 | (60.2, 66.2) | 67.6 | (62.8, 72.4) | 0.001 |  | 60.3 | (56.7, 64.0) | 66.4 | (63.3, 69.6) | 74.2 | (70.0, 78.4) | <0.001 |
| Sugar | (g/day) | 5.6 | (4.8, 6.4) | 5.1 | (4.6, 5.7) | 4.9 | (3.9, 5.9) | 0.351 |  | 7.3 | (6.2, 8.5) | 7.2 | (6.4, 8.0) | 6.9 | (5.7, 8.2) | 0.555 |  | 7.2 | (6.8, 7.7) | 7.2 | (6.6, 7.7) | 6.8 | (5.8, 7.8) | 0.409 |  | 7.3 | (7.0, 7.7) | 7.3 | (7.0, 7.7) | 7.6 | (7.0, 8.2) | 0.871 |  | 7.8 | (7.3, 8.2) | 8.3 | (8.0, 8.7) | 8.2 | (7.7, 8.7) | 0.280 |
| Beans | (g/day) | 38.7 | (31.5, 45.8) | 45.0 | (40.4, 49.5) | 64.1 | (55.1, 73.1) | <0.001 |  | 49.8 | (41.2, 58.5) | 55.3 | (49.4, 61.2) | 69.0 | (59.7, 78.4) | 0.003 |  | 59.7 | (55.3, 64.0) | 58.7 | (53.9, 63.6) | 74.1 | (65.1, 83.2) | 0.047 |  | 71.9 | (68.2, 75.6) | 71.7 | (68.1, 75.3) | 87.1 | (81.3, 92,9) | <0.001 |  | 63.6 | (59.7, 67.5) | 76.3 | (72.9, 79.6) | 82.9 | (78.4, 87.3) | <0.001 |
| Seeds | (g/day) | 2.1 | (1.4, 2.8) | 1.8 | (1.4, 2.3) | 1.5 | (0.7, 2.4) | 0.274 |  | 1.7 | (1.0, 2.5) | 2.0 | (1.4, 2.5) | 2.2 | (1.4, 3.0) | 0.250 |  | 1.7 | (1.4, 2.0) | 1.6 | (1.2, 1.9) | 1.9 | (1.2, 2.5) | 0.815 |  | 2.3 | (1.9, 2.7) | 2.6 | (2.3, 3.0) | 2.6 | (2.0, 3.2) | 0.249 |  | 2.6 | (2.1, 3.1) | 3.0 | (2.6, 3.4) | 3.4 | (2.4, 4.0) | 0.027 |
| Vegetables | (g/day) | 208.8 | (194.3, 223.3) | 222.6 | (213.6, 231.8) | 274.5 | (257.3, 292.7) | <0.001 |  | 255.8 | (234.3, 277.4) | 318.4 | (303.6, 333.1) | 360.6 | (337.2, 383.9) | <0.001 |  | 274.3 | (264.7, 283.9) | 321.3 | (310.5, 332.0) | 385.4 | (365.5, 405.3) | <0.001 |  | 301.0 | (293.0, 309.0) | 352.1 | (344.3, 359.9) | 405.3 | (392.7, 417.8) | <0.001 |  | 286.0 | (277.2, 294.7) | 336.4 | (328.8, 344.0) | 393.5 | (383.6, 403.5) | <0.001 |
| Fruits | (g/day) | 90.3 | (77.5, 103.2) | 86.8 | (78.6, 94.9) | 82.3 | (66.2, 98.4) | 0.662 |  | 101.5 | (82.2, 119.7) | 95.6 | (83.1, 108.1) | 89.6 | (69.8, 109.4) | 0.334 |  | 88.8 | (81.9, 95.8) | 82.3 | (74.5, 90.0) | 82.6 | (68.2, 97.0) | 0.304 |  | 141.8 | (135.8, 147.8) | 128.3 | (122.5, 134.2) | 121.1 | (111.7, 130.6) | <0.001 |  | 172.8 | (165.6, 180.1) | 174.3 | (168.0, 180.5) | 163.4 | (155.2, 171.7) | 0.127 |
| Mushrooms | (g/day) | 11.5 | (9.2, 13.7) | 12.8 | (11.4, 14.3) | 17.8 | (15.0, 20.6) | 0.002 |  | 14.6 | (10.7, 18.5) | 20.0 | (17.3, 22.7) | 19.6 | (15.4, 23.9) | 0.045 |  | 16.4 | (14.8, 17.9) | 19.5 | (17.7, 21.2) | 19.7 | (16.5, 23.0) | 0.003 |  | 19.0 | (17.5, 20.4) | 22.4 | (21.1, 23.8) | 25.5 | (23.3, 27.8) | <0.001 |  | 18.6 | (17.0, 20.1) | 19.7 | (18.3, 21.1) | 23.6 | (21.8, 25.4) | <0.001 |
| Seaweeds | (g/day) | 5.9 | (4.1, 7.7) | 7.5 | (6.4, 8.7) | 10.9 | (8.6, 13.1) | 0.001 |  | 8.0 | (5.4, 10.5) | 9.2 | (7.5, 11.0) | 15.0 | (12.2, 17.8) | <0.001 |  | 8.3 | (7.1, 9.5) | 10.9 | (9.6, 12.3) | 16.6 | (14.0, 19.1) | <0.001 |  | 10.4 | (9.3, 11.4) | 11.7 | (10.7, 12.8) | 14.7 | (13.1, 16.3) | <0.001 |  | 12.9 | (11.6, 14.2) | 12.9 | (11.8, 14.0) | 14.8 | (13.3, 16.2) | 0.054 |
| Fish | (g/day) | 43.9 | (37.9, 45.9) | 38.9 | (45.1, 52,8) | 55.8 | (48.3, 63.4) | 0.018 |  | 59.5 | (50.0, 69.0) | 70.0 | (63.5, 76.5) | 69.5 | (59.2, 79.8) | 0.076 |  | 62.5 | (58.8, 66.2) | 71.0 | (66.9, 75.2) | 76.7 | (69.1, 84.4) | <0.001 |  | 76.7 | (73.6, 79.9) | 83.8 | (80.7, 86.9) | 90.8 | (85.8, 95.7) | <0.001 |  | 82.4 | (78.8, 86.0) | 89.4 | (86.3, 92.6) | 102.1 | (98.0, 106.2) | <0.001 |
| Meat | (g/day) | 81.3 | (74.2, 88.5) | 86.6 | (82.1, 91.2) | 82.3 | (73.4, 91.3) | 0.743 |  | 124.9 | (114.1, 135.6) | 136.0 | (128.6, 143.4) | 124.0 | (112.4, 135.7) | 0.751 |  | 106.3 | (102.4, 110.2) | 113.2 | (108.9, 117.6) | 110.7 | (102.6, 118.7) | 0.137 |  | 84.2 | (81.3, 87.1) | 92.9 | (90.1, 95.7) | 92.5 | (87.9, 97.0) | 0.001 |  | 50.0 | (47.5, 52.6) | 58.2 | (56.0, 60.4) | 62.8 | (59.9, 65.7) | <0.001 |
| Eggs | (g/day) | 31.1 | (27.2, 35.0) | 28.2 | (25.7, 30.7) | 31.2 | (26.3, 36.2) | 0.998 |  | 49.4 | (43.6, 55.2) | 46.2 | (42.2, 50.1) | 50.5 | (44.2, 56.8) | 0.936 |  | 39.3 | (37.2, 41.4) | 42.4 | (40.0, 44.7) | 50.7 | (46.4, 55.0) | <0.001 |  | 34.6 | (33.0, 36.2) | 41.2 | (39.7, 42.8) | 46.3 | (43.8, 48.8) | <0.001 |  | 31.5 | (29.8, 33.2) | 31.9 | (30.5, 33.4) | 36.1 | (34.2, 38.0) | 0.001 |
| Milk | (g/day) | 282.7 | (263.9, 301.5) | 312.2 | (300.2, 324.2) | 294.6 | (271.0, 318.1) | 0.277 |  | 229.8 | (205.3, 254.3) | 269.9 | (253.1, 286.7) | 242.4 | (215.8, 269.1) | 0.145 |  | 117.6 | (109.6, 125.5) | 109.9 | (101.0, 118.8) | 99.6 | (83.2, 116.1) | 0.058 |  | 123.4 | (117.7, 129.2) | 113.1 | (107.5, 118.7) | 108.0 | (99.0, 117.1) | 0.003 |  | 126.5 | (119.9, 133.1) | 112.5 | (116.7, 128.2) | 110.2 | (102.6, 117.8) | 0.002 |
| Oils | (g/day) | 9.0 | (8.1, 9.9) | 8.7 | (8.1, 9.2) | 8.5 | (7.4, 9.5) | 0.521 |  | 13.6 | (12.3, 15.0) | 13.2 | (12.3, 14.1) | 12.6 | (11.1, 14.1) | 0.257 |  | 12.6 | (12.1, 13.1) | 13.3 | (12.7, 13.9) | 12.4 | (11.3, 13.5) | 0.640 |  | 11.2 | (10.8, 11.6) | 11.6 | (11.2, 12.0) | 10.7 | (10.1, 11.3) | 0.404 |  | 7.7 | (7.3, 8.0) | 7.6 | (7.2, 7.9) | 7.0 | (6.6, 7.4) | 0.022 |
| Sweets | (g/day) | 38.0 | (32.4, 43.7) | 34.9 | (31.3, 38.5) | 24.6 | (17.5, 31.7) | 0.007 |  | 49.8 | (42.7, 57.0) | 36.0 | (31.0, 41.0) | 32.4 | (24.5, 40.3) | 0.002 |  | 41.2 | (38.3, 44.1) | 28.1 | (24.9, 31.4) | 22.4 | (16.4, 28.5) | <0.001 |  | 35.0 | (33.0, 37.1) | 30.1 | (28.2, 32.1) | 27.8 | (24.6, 31.0) | <0.001 |  | 26.2 | (24.3, 28.1) | 26.3 | (24.6, 28.0) | 21.5 | (19.3, 23.7) | 0.005 |
| Luxury drinks | (g/day) | 2.4 | (1.8, 2.9) | 2.6 | (2.2, 2.9) | 2.2 | (1.5, 2.9) | 0.980 |  | 3.3 | (0.1, 8.6) | 3.2 | (0.9, 5.5) | 7.1 | (3.5, 10.7) | 0.123 |  | 74.0 | (64.0, 84.1) | 40.8 | (29.5, 52.0) | 16.9 | (3.8, 37.7) | <0.001 |  | 99.9 | (91.5, 108.3) | 55.7 | (47.5, 63.9) | 38.9 | (25.7, 52.1) | <0.001 |  | 40.6 | (35.9, 45.3) | 20.0 | (15.9, 24.1) | 13.6 | (8,1, 19.0) | <0.001 |
| Seasonings | (g/day) | 71.9 | (63.2, 80.5) | 62.3 | (56.7, 67.8) | 74.2 | (63.3, 85.0) | 0.805 |  | 87.4 | (77.8, 99.9) | 82.8 | (76.2, 89.4) | 96.1 | (85.8, 106.5) | 0.401 |  | 98.9 | (93.8, 103.9) | 97.1 | (91.5, 102.8) | 98.7 | (88.3, 109.2) | 0.836 |  | 106.0 | (102.0, 110.0) | 99.5 | (95.6, 103.3) | 98.3 | (92.1, 104.6) | 0.024 |  | 91.7 | (87.5, 95.9) | 88.7 | (85.1, 92.3) | 90.0 | (85.3, 94.8) | 0.459 |
| Food intake from each food group is expressed as the adjusted mean and 95% confidence intervals (95% CI), | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| using a mixed effects model with 9 regions in Japan (Hokkaido, Tohoku, Kanto, Hokuriku, Tokai, Kinki, Chugoku, Shikoku, and Kyushu) and age as the random effects | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| \*An SMS meal was defined as a combination of staple, main, and side dishes. The frequency of SMS meals was classified as once or less than once a day, twice a day, and three times or more a day. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |