Questionnaires were sent to all registered residents

2013 Survey

n = 212,372

2012 Survey

n =211,615

2011 Survey

n = 210,189

Answered

n = 55,850

Answered

n = 66,238

Answered

n = 92,126

≥16-year-old

n = 73,368

≥16-year-old

n = 54,063

≥16-year-old

n = 45,233

Sensitive analysis

n = 22,805

Sensitive analysis

n = 22,805

<3 missing items of FFQ

n = 40,742

<3 missing items of FFQ

n = 67,358

<3 missing items of FFQ

n = 48,377

Sensitive analysis

n = 22,805

**Supplementary Figure 1**. Flow chart of survey participants for analysis (total 156,477, of which 22,805 participated in all three surveys).

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 1**. Frequency of consumption of foods and food groups, FHMS, 2011–2013 (n = 156,477). | | | | | | | | | | | | |
|  | 2011 | | |  | 2012 | | |  | 2013 | | |  |
|  | Mean | SD | ≥0.5 time/d, % |  | Mean | SD | ≥0.5 time/d, % |  | Mean | SD | ≥0.5 time/d, % | *P* for trend\* |
| Men, n = 68,457 |  |  |  |  |  |  |  |  |  |  |  |  |
| Beef/pork | 0.3 | 0.21 | 31.6 |  | 0.3 | 0.21 | 30.0 |  | 0.3 | 0.21 | 31.2 | 0.173 |
| Bread | 0.3 | 0.21 | 26.0 |  | 0.3 | 0.21 | 25.6 |  | 0.31 | 0.21 | 26.4 | 0.401 |
| Chicken | 0.24 | 0.21 | 18.0 |  | 0.24 | 0.21 | 19.0 |  | 0.25 | 0.21 | 20.4 | 0.0001 |
| Fish | 0.43 | 0.5 | 52.9 |  | 0.44 | 0.5 | 55.3 |  | 0.44 | 0.5 | 54.7 | 0.0001 |
| Fruit | 0.37 | 0.21 | 38.9 |  | 0.41 | 0.21 | 43.1 |  | 0.42 | 0.21 | 44.2 | 0.0001 |
| Fruit juice | 0.15 | 0.14 | 11.0 |  | 0.16 | 0.14 | 12.1 |  | 0.16 | 0.14 | 11.7 | 0.006 |
| Green vegetables | 0.46 | 0.5 | 53.7 |  | 0.49 | 0.5 | 57.9 |  | 0.52 | 0.5 | 61.3 | 0.0001 |
| Ham/sausage | 0.24 | 0.21 | 18.9 |  | 0.24 | 0.21 | 18.3 |  | 0.24 | 0.21 | 18.2 | 0.058 |
| Milk | 0.34 | 0.21 | 35.0 |  | 0.35 | 0.21 | 35.4 |  | 0.36 | 0.21 | 36.5 | 0.001 |
| Miso soup | 0.73 | 1 | 80.7 |  | 0.73 | 1 | 79.9 |  | 0.72 | 1 | 79.5 | 0.001 |
| Fermented beans | 0.37 | 0.21 | 39.9 |  | 0.4 | 0.21 | 42.7 |  | 0.41 | 0.21 | 44.4 | 0.0001 |
| Boiled beans | 0.16 | 0.14 | 9.5 |  | 0.17 | 0.14 | 11.3 |  | 0.18 | 0.14 | 12.0 | 0.0001 |
| Rice | 0.96 | 1 | 98.8 |  | 0.93 | 1 | 96.3 |  | 0.93 | 1 | 97.2 | 0.0001 |
| Tofu | 0.39 | 0.21 | 45.6 |  | 0.41 | 0.21 | 47.3 |  | 0.41 | 0.21 | 47.0 | 0.001 |
| Soy milk | 0.06 | 0 | 4.3 |  | 0.07 | 0 | 5.2 |  | 0.07 | 0 | 5.7 | 0.0001 |
| Vegetable juice | 0.16 | 0.14 | 13.2 |  | 0.19 | 0.14 | 16.1 |  | 0.19 | 0.14 | 16.9 | 0.0001 |
| White vegetables | 0.52 | 0.5 | 65.7 |  | 0.53 | 0.5 | 65.9 |  | 0.54 | 0.5 | 66.9 | 0.017 |
| Red/yellow vegetables | 0.41 | 0.21 | 46.8 |  | 0.43 | 0.21 | 49.4 |  | 0.45 | 0.5 | 52.5 | 0.0001 |
| Yogurt | 0.33 | 0.21 | 32.6 |  | 0.37 | 0.21 | 37.2 |  | 0.41 | 0.21 | 41.6 | 0.0001 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |
| Women, n = 88,020 |  |  |  |  |  |  |  |  |  |  |  |  |
| Beef/pork | 0.32 | 0.21 | 36.6 |  | 0.32 | 0.21 | 36.3 |  | 0.33 | 0.21 | 37.5 | 0.043 |
| Bread | 0.36 | 0.21 | 34.3 |  | 0.35 | 0.21 | 33.2 |  | 0.37 | 0.21 | 34.0 | 0.318 |
| Chicken | 0.25 | 0.21 | 19.3 |  | 0.25 | 0.21 | 21.1 |  | 0.26 | 0.21 | 21.6 | 0.0001 |
| Fish | 0.42 | 0.5 | 53.8 |  | 0.44 | 0.5 | 56.5 |  | 0.44 | 0.5 | 55.7 | 0.0001 |
| Fruit | 0.5 | 0.5 | 56.1 |  | 0.54 | 0.5 | 60.3 |  | 0.55 | 0.5 | 60.4 | 0.0001 |
| Fruit juice | 0.16 | 0.14 | 12.6 |  | 0.17 | 0.14 | 13.4 |  | 0.16 | 0.14 | 12.0 | 0.144 |
| Green vegetables | 0.5 | 0.5 | 60.0 |  | 0.54 | 0.5 | 65.9 |  | 0.57 | 0.5 | 68.5 | 0.0001 |
| Ham/sausage | 0.25 | 0.21 | 20.3 |  | 0.24 | 0.21 | 20.3 |  | 0.24 | 0.21 | 19.5 | 0.012 |
| Milk | 0.4 | 0.21 | 41.9 |  | 0.41 | 0.21 | 42.7 |  | 0.42 | 0.21 | 43.8 | 0.0001 |
| Miso soup | 0.73 | 1 | 80.5 |  | 0.72 | 0.79 | 79.5 |  | 0.71 | 0.79 | 79.0 | 0.0001 |
| Fermented beans | 0.39 | 0.21 | 41.8 |  | 0.42 | 0.21 | 45.5 |  | 0.42 | 0.21 | 45.6 | 0.0001 |
| Boiled beans | 0.17 | 0.14 | 12.2 |  | 0.19 | 0.14 | 13.8 |  | 0.19 | 0.14 | 13.7 | 0.0001 |
| Rice | 0.95 | 1 | 98.2 |  | 0.92 | 1 | 95.7 |  | 0.93 | 1 | 96.7 | 0.0001 |
| Tofu | 0.43 | 0.5 | 51.5 |  | 0.44 | 0.5 | 52.1 |  | 0.44 | 0.5 | 51.8 | 0.362 |
| Soy milk | 0.09 | 0 | 7.3 |  | 0.11 | 0 | 9.5 |  | 0.11 | 0 | 9.4 | 0.0001 |
| Vegetable juice | 0.16 | 0.14 | 13.8 |  | 0.19 | 0.14 | 16.6 |  | 0.19 | 0.14 | 15.8 | 0.0001 |
| White vegetables | 0.61 | 0.5 | 78.3 |  | 0.61 | 0.5 | 77.6 |  | 0.62 | 0.5 | 78.4 | 0.849 |
| Red/yellow vegetables | 0.49 | 0.5 | 61.2 |  | 0.51 | 0.5 | 63.8 |  | 0.54 | 0.5 | 66.1 | 0.0001 |
| Yogurt | 0.48 | 0.5 | 51.9 |  | 0.52 | 0.5 | 56.2 |  | 0.55 | 0.5 | 58.7 | 0.0001 |
| FHMS, Fukushima Health Management Survey.  \* Cochran-Armitage Trend Test for proportions of the food item consumed ≥0.5 times/d over years. | | | | | | | |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 2**. Factor loadings of dietary patterns identified by principle component analysis, FMHS, 2011–2013 (n = 156,477). | | | | | | | | | | | |
|  | Typical | | |  | Juice | | |  | Meat | | |
| Foods and food groups | 2011 | 2012 | 2013 |  | 2011 | 2012 | 2013 |  | 2011 | 2012 | 2013 |
| Men |  |  |  |  |  |  |  |  |  |  |  |
| n = 68,457 | 29,343 | 21,182 | 17,932 |  | 29,343 | 21,182 | 17,932 |  | 29,343 | 21,182 | 17,932 |
| % variance explained | 4.29 | 1.84 | 1.65 |  | 4.56 | 1.82 | 1.60 |  | 4.39 | 1.84 | 1.59 |
| Beef/pork | 0.11 | 0.14 | 0.13 |  | −0.02 | 0.00 | 0.01 |  | **0.77** | **0.79** | **0.77** |
| Boiled beans | **0.42** | **0.44** | **0.42** |  | **0.39** | **0.38** | **0.38** |  | 0.07 | 0.07 | 0.07 |
| Bread | −0.16 | −0.18 | −0.14 |  | **0.34** | **0.36** | **0.36** |  | 0.25 | 0.23 | 0.21 |
| Chicken | 0.14 | 0.16 | 0.12 |  | 0.08 | 0.10 | 0.09 |  | **0.73** | **0.75** | **0.75** |
| Fermented beans | **0.48** | **0.50** | **0.49** |  | 0.14 | 0.15 | 0.13 |  | −0.16 | −0.13 | −0.12 |
| Fish | **0.55** | **0.57** | **0.53** |  | 0.05 | 0.06 | 0.05 |  | 0.19 | 0.21 | 0.24 |
| Fruit | **0.51** | **0.50** | **0.51** |  | **0.41** | **0.42** | **0.40** |  | −0.06 | −0.05 | −0.06 |
| Fruit juice | −0.02 | 0.01 | 0.00 |  | **0.68** | **0.66** | **0.68** |  | 0.15 | 0.16 | 0.13 |
| Green vegetables | **0.71** | **0.72** | **0.73** |  | 0.16 | 0.17 | 0.14 |  | 0.18 | 0.16 | 0.15 |
| Ham/sausage | 0.04 | 0.05 | 0.04 |  | 0.07 | 0.10 | 0.10 |  | **0.71** | **0.70** | **0.71** |
| Milk | 0.21 | 0.23 | 0.22 |  | **0.41** | **0.40** | **0.39** |  | −0.04 | −0.01 | −0.03 |
| Miso soup | **0.64** | **0.66** | **0.65** |  | −0.09 | −0.11 | −0.11 |  | −0.11 | −0.05 | −0.06 |
| Red/yellow vegetables | **0.67** | **0.67** | **0.68** |  | 0.24 | 0.26 | 0.22 |  | 0.25 | 0.22 | 0.22 |
| Rice | **0.39** | **0.46** | **0.44** |  | −0.16 | −0.22 | −0.18 |  | 0.01 | 0.07 | 0.00 |
| Soy milk | 0.07 | 0.09 | 0.07 |  | **0.47** | **0.45** | **0.47** |  | 0.00 | 0.01 | 0.02 |
| Tofu | **0.65** | **0.65** | **0.64** |  | 0.14 | 0.15 | 0.14 |  | 0.03 | 0.05 | 0.05 |
| Vegetable juice | −0.05 | −0.03 | −0.04 |  | **0.68** | **0.67** | **0.69** |  | 0.10 | 0.10 | 0.10 |
| White vegetables | **0.73** | **0.73** | **0.74** |  | 0.09 | 0.13 | 0.11 |  | 0.20 | 0.18 | 0.18 |
| Yogurt | 0.25 | 0.27 | 0.29 |  | **0.55** | **0.53** | **0.50** |  | −0.06 | −0.07 | −0.07 |
|  |  |  |  |  |  |  |  |  |  |  |  |
| Women |  |  |  |  |  |  |  |  |  |  |  |
| n = 88,020 | 38,015 | 27,195 | 22,810 |  | 38,015 | 27,195 | 22,810 |  | 38,015 | 27,195 | 22,810 |
| % variance explained | 4.26 | 1.73 | 1.60 |  | 4.48 | 1.72 | 1.58 |  | 4.39 | 1.70 | 1.56 |
| Beef/pork | 0.16 | 0.19 | 0.20 |  | −0.06 | −0.03 | −0.04 |  | **0.75** | **0.76** | **0.75** |
| Boiled beans | **0.44** | **0.44** | **0.42** |  | **0.36** | **0.35** | **0.36** |  | 0.02 | 0.04 | 0.05 |
| Bread | −0.13 | −0.16 | −0.12 |  | 0.26 | 0.29 | 0.25 |  | **0.30** | 0.28 | 0.29 |
| Chicken | 0.15 | 0.18 | 0.17 |  | 0.07 | 0.09 | 0.08 |  | **0.71** | **0.72** | **0.72** |
| Fermented beans | **0.49** | **0.52** | **0.51** |  | 0.18 | 0.17 | 0.19 |  | −0.12 | −0.11 | −0.12 |
| Fish | **0.57** | **0.59** | **0.57** |  | 0.07 | 0.07 | 0.08 |  | 0.17 | 0.19 | 0.18 |
| Fruit | **0.53** | **0.53** | **0.53** |  | **0.35** | **0.35** | **0.34** |  | −0.08 | −0.07 | −0.08 |
| Fruit juice | −0.02 | 0.01 | 0.01 |  | **0.67** | **0.67** | **0.67** |  | 0.15 | 0.16 | 0.15 |
| Green vegetables | **0.69** | **0.72** | **0.72** |  | 0.14 | 0.14 | 0.12 |  | 0.15 | 0.14 | 0.15 |
| Ham/sausage | 0.03 | 0.05 | 0.03 |  | 0.07 | 0.08 | 0.07 |  | **0.71** | **0.70** | **0.70** |
| Milk | 0.23 | 0.23 | 0.23 |  | **0.31** | **0.32** | **0.32** |  | 0.06 | 0.06 | 0.04 |
| Miso soup | **0.64** | **0.65** | **0.64** |  | −0.12 | −0.13 | −0.12 |  | −0.07 | −0.01 | −0.04 |
| Red/yellow vegetables | **0.68** | **0.69** | **0.68** |  | 0.19 | 0.20 | 0.17 |  | 0.23 | 0.21 | 0.24 |
| Rice | **0.40** | **0.42** | **0.41** |  | −0.23 | −0.24 | −0.20 |  | 0.03 | 0.09 | 0.02 |
| Soy milk | 0.06 | 0.06 | 0.03 |  | **0.44** | **0.46** | **0.46** |  | 0.00 | −0.01 | 0.03 |
| Tofu | **0.66** | **0.66** | **0.65** |  | 0.14 | 0.14 | 0.14 |  | 0.03 | 0.05 | 0.06 |
| Vegetable juice | 0.02 | 0.02 | 0.01 |  | **0.72** | **0.72** | **0.73** |  | 0.07 | 0.08 | 0.08 |
| White vegetables | **0.72** | **0.73** | **0.72** |  | 0.06 | 0.07 | 0.06 |  | 0.18 | 0.17 | 0.20 |
| Yogurt | 0.28 | **0.30** | **0.31** |  | **0.50** | **0.49** | **0.48** |  | −0.06 | −0.06 | −0.07 |