**Supplementary Material**

This appendix has been provided by the authors to give readers additional information about their work

**Supplemental Table 1:** Mean intake in cups (S.E.) of 2010 MyPyramid food groups and US Healthy Food Diversity index scores among adults ages 20+ years from the National Health and Nutrition Examination Survey 2003-2006 using 2-day means

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Overall Population**  (n=7,470) | | **Men**  (n=3,786) | | **Women**  (n=3,684) | |
|  | **2-day mean estimate (cups)** | **S.E.** | **2-day mean estimate (cups)** | **S.E.** | **2-day mean estimate (cups)** | **S.E.** |
| Whole Grains | 0.37 | 0.013 | 0.40 | 0.017 | 0.34 | 0.014 |
| Refined Grains | 2.98 | 0.030 | 3.52 | 0.034 | 2.46 | 0.032 |
| Dark Green Vegetables | 0.12 | 0.005 | 0.11 | 0.008 | 0.13 | 0.008 |
| Orange Vegetables | 0.08 | 0.003 | 0.07 | 0.004 | 0.08 | 0.003 |
| Tomato | 0.38 | 0.011 | 0.43 | 0.014 | 0.32 | 0.012 |
| Potato | 0.40 | 0.013 | 0.47 | 0.018 | 0.33 | 0.012 |
| Starchy Vegetables | 0.09 | 0.005 | 0.09 | 0.006 | 0.08 | 0.005 |
| Other Vegetables | 0.61 | 0.013 | 0.63 | 0.018 | 0.59 | 0.015 |
| Legumes | 0.10 | 0.005 | 0.12 | 0.007 | 0.08 | 0.004 |
| Citrus Fruit, Melon, and Berries | 0.44 | 0.017 | 0.46 | 0.019 | 0.43 | 0.021 |
| Other Fruit | 0.56 | 0.023 | 0.59 | 0.026 | 0.54 | 0.024 |
| Milk | 0.87 | 0.030 | 0.97 | 0.041 | 0.77 | 0.028 |
| Yogurt | 0.04 | 0.003 | 0.03 | 0.003 | 0.05 | 0.004 |
| Cheese | 0.65 | 0.017 | 0.76 | 0.023 | 0.55 | 0.013 |
| Nuts | 0.08 | 0.003 | 0.09 | 0.005 | 0.07 | 0.004 |
| Soy | 0.01 | 0.001 | 0.01 | 0.002 | 0.01 | 0.001 |
| Lean Meat | 0.51 | 0.012 | 0.64 | 0.017 | 0.37 | 0.013 |
| Franks | 0.21 | 0.007 | 0.27 | 0.010 | 0.14 | 0.006 |
| Organ Meat | 0.005 | 0.001 | 0.005 | 0.0001 | 0.004 | 0.0001 |
| Poultry | 0.36 | 0.012 | 0.41 | 0.014 | 0.31 | 0.012 |
| High Omega-3 Fish | 0.04 | 0.003 | 0.04 | 0.004 | 0.04 | 0.005 |
| Low Omega-3 Fish | 0.12 | 0.008 | 0.14 | 0.010 | 0.10 | 0.008 |
| Eggs | 0.12 | 0.003 | 0.14 | 0.004 | 0.10 | 0.003 |
| Oils | 0.08 | 0.001 | 0.09 | 0.002 | 0.07 | 0.001 |
| Added Sugars | 0.38 | 0.007 | 0.45 | 0.010 | 0.31 | 0.008 |
| Discretionary Solid Fats | 0.19 | 0.002 | 0.22 | 0.002 | 0.16 | 0.002 |
| Total Intake | 9.78 | 0.090 | 11.17 | 0.095 | 8.44 | 0.079 |

**Supplemental Table 2:** Comparison mean 2-day nutrient intakes to estimated average requirements and probabilities of nutrient adequacy in adults ages 20+ years in the National Health and Nutrition Examination Survey 2003-2006

|  | **Men**  (n=3,786) | | | | | **Women**  (n=3,684) | | | | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Estimated Average Requirement & Coefficient of Variation (%)a | Within-Subject Variation  ages 19-50 (ages 51-70) | Mean | S.E. | Probability of Adequacy | Estimated Average Requirement & Coefficient of Variation (%)a | Within-Subject Variation ages 19-50 (ages 51-70) | Mean | S.E. | Probability of Adequacy |
| Mean probability of adequacy (15 nutrients) | --- | --- | --- |  | 0.68 | --- | --- | --- |  | 0.60 |
| Energy (kcal) |  |  | 2521.84 | 21.19 | NA |  |  | 1776.73 | 12.33 | NA |
| Vitamin A (RAE) | 625  (20) | 1,160  (1,619) | 691.70 | 15.37 | 0.51 | 500  (20) | 1,300  (1,255) | 594.31 | 9.01 | 0.53 |
| Vitamin C (mg) | 75  (10) | 93  (72) | 94.75 | 2.28 | 0.53 | 60  (10) | 73  (61) | 81.63 | 1.91 | 0.57 |
| Vitamin E (mg αTE) | 12  (10) | 7  (9) | 8.12 | 0.14 | 0.27 | 12  (10) | 5  (6) | 6.45 | 0.10 | 0.14 |
| Thiamin (mg) | 1.0  (10) | 0.9  (0.7) | 1.95 | 0.02 | 0.83 | 0.9  (10) | 0.6  (0.5) | 1.41 | 0.01 | 0.75 |
| Riboflavin (mg) | 1.1  (10) | 1.0  (0.8) | 2.62 | 0.03 | 0.90 | 0.9  (10) | 0.6  (0.6) | 1.93 | 0.02 | 0.88 |
| Niacin (mg) | 12  (15) | 12  (9) | 29.72 | 0.33 | 0.91 | 11  (15) | 9  (7) | 20.50 | 0.20 | 0.82 |
| Folate (µg) | 320  (10) | 180  (150) | 240.88 | 2.57 | 0.29 | 320  (10) | 131  (12) | 189.66 | 2.74 | 0.13 |
| Vitamin B6 (mg) | 1.1 if <50 1.4 if>50 (10) | 1.0  (0.8) | 2.32 | 0.03 | 0.81 | 1.1 if <50  1.3 if>50 (10) | 0.8  (0.6) | 1.66 | 0.02 | 0.66 |
| Vitamin B12 (µg) | 2.0  (10) | 13  (14) | 6.76 | 0.24 | 0.66 | 2.0  (10) | 12  (10) | 4.44 | 0.09 | 0.61 |
| Phosphorus (mg) | 580  (10) | 573  (408) | 1550.33 | 15.62 | 0.94 | 580  (10) | 395  (313) | 1126.87 | 11.62 | 0.88 |
| Magnesium (mg) | 350  (10) | 122  (94) | 328.77 | 3.58 | 0.42 | 255 if 19-30  265 if >30 (10) | 86  (74) | 251.43 | 3.63 | 0.41 |
| Iron (mg)b | 6 | 9 | 18.79 | 0.23 | 0.98 | 8.1 if <50, 5 if >50 | 7 | 13.63 | 0.13 | 0.87 |
| Copper (mg) | 0.7  (15) | 0.7  (0.7) | 1.52 | 0.02 | 0.84 | 0.7  (15) | 0.6  (0.5) | 1.14 | 0.02 | 0.75 |
| Zinc (mg) | 9.4  (10) | 9  (8) | 14.79 | 0.28 | 0.70 | 6.8  (10) | 6  (5) | 10.22 | 0.17 | 0.69 |
| Calcium (mg)c | 800 if <70  1000 if >70  (10) | 492  (339) | 1018.84 | 14.96 | 0.58 | 800 if <50  1000 if >50  (10) | 325  (256) | 799.12 | 10.63 | 0.37 |

aThe standard deviation for nutrients with an Estimated Average Requirement (EAR) is calculated by multiplying the coefficient of variation (COV) by the EAR.

b The probability for inadequacy for iron intakes is used from published tables ([44](#_ENREF_44))

c The Coefficient of Variation for calcium is assumed to be 10% ([57](#_ENREF_57))

**Supplemental Table 3**: 2-day mean intake in cups for 26 MyPyramid food groups for the overall population and by smoking status and sex in adults age 20+ years in the National Health and Nutrition Examination Survey 2003-2006a

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Overall Population** (n=7,470)  Mean | **S.E.** | **Smokers**  (n=1,652)  Mean | **S.E.** | **Non-smokers**  (n=5,812)  Mean | **S.E.** | **Men**  (n=3,786)  Mean | **S.E.** | **Women**  (n=3,684)  Mean | **S.E.** |
| Whole Grains | 0.37 | 0.013 | 0.23 | 0.03 | 0.40 \*\*\* | 0.02 | 0.37 | 0.04 | 0.36 | 0.03 |
| Refined Grains | 2.98 | 0.030 | 2.73 | 0.07 | 2.92\*\* | 0.07 | 2.90 | 0.09 | 2.85 | 0.017 |
| Dark Green Vegetables | 0.12 | 0.005 | 0.07 | 0.01 | 0.14 \*\*\* | 0.01 | 0.11 | 0.02 | 0.14  p=0.06 | 0.01 |
| Orange Vegetables | 0.08 | 0.003 | 0.05 | 0.009 | 0.08 \*\*\* | 0.008 | 0.07 | 0.009 | 0.08 | 0.008 |
| Tomato | 0.38 | 0.011 | 0.32 | 0.03 | 0.38 \*\* | 0.03 | 0.36 | 0.03 | 0.37 | 0.03 |
| Potato | 0.40 | 0.013 | 0.42 | 0.03 | 0.38 | 0.02 | 0.41 | 0.03 | 0.37 \* | 0.02 |
| Starchy Vegetables | 0.09 | 0.005 | 0.06 | 0.009 | 0.09 \*\*\* | 0.01 | 0.08 | 0.01 | 0.08 | 0.01 |
| Other Vegetables | 0.61 | 0.013 | 0.50 | 0.008 | 0.63 \*\*\* | 0.03 | 0.56 | 0.04 | 0.63 \*\* | 0.03 |
| Legumes | 0.10 | 0.005 | 0.08 | 0.02 | 0.10 | 0.01 | 0.10 | 0.02 | 0.09 \* | 0.01 |
| Citrus Fruit, Melon, and Berries | 0.44 | 0.017 | 0.35 | 0.01 | 0.48 \*\*\* | 0.01 | 0.41 | 0.05 | 0.46 \* | 0.04 |
| Other Fruit | 0.56 | 0.023 | 0.34 | 0.04 | 0.63 \*\*\* | 0.03 | 0.55 | 0.04 | 0.57 | 0.03 |
| Milk | 0.87 | 0.030 | 0.77 | 0.07 | 0.86 \* | 0.04 | 0.78 | 0.06 | 0.89 \*\* | 0.04 |
| Yogurt | 0.04 | 0.003 | 0.02 | 0.006 | 0.04 \*\*\* | 0.006 | 0.03 | 0.005 | 0.05 \*\*\* | 0.005 |
| Cheese | 0.65 | 0.017 | 0.67 | 0.06 | 0.61 | 0.04 | 0.58 | 0.05 | 0.66 \*\* | 0.04 |
| Nuts | 0.08 | 0.003 | 0.05 | 0.009 | 0.08 \*\*\* | 0.01 | 0.07 | 0.01 | 0.08 \* | 0.01 |
| Soy | 0.01 | 0.001 | 0.003 | 0.002 | 0.01 \*\*\* | 0.002 | 0.007 | 0.0003 | 0.01 | 0.0002 |
| Lean Meat | 0.51 | 0.012 | 0.54 | 0.04 | 0.47 \*\* | 0.04 | 0.54 | 0.05 | 0.44 \*\*\* | 0.04 |
| Frankfurters | 0.21 | 0.007 | 0.24 | 0.02 | 0.19 \*\* | 0.02 | 0.24 | 0.02 | 0.16 \*\*\* | 0.02 |
| Organ Meat | 0.005 | 0.001 | 0.005 | 0.002 | 0.004 | 0.001 | 0.005 | 0.002 | 0.004 | 0.001 |
| Poultry | 0.36 | 0.012 | 0.33 | 0.02 | 0.36 \* | 0.02 | 0.36 | 0.03 | 0.34 | 0.02 |
| High Omega-3 Fish | 0.04 | 0.003 | 0.03 | 0.007 | 0.04 \* | 0.008 | 0.04 | 0.009 | 0.04 | 0.007 |
| Low Omega-3 Fish | 0.12 | 0.008 | 0.10 | 0.02 | 0.12 \* | 0.02 | 0.13 | 0.02 | 0.11\* | 0.02 |
| Eggs | 0.12 | 0.003 | 0.11 | 0.01 | 0.12 | 0.006 | 0.13 | 0.008 | 0.11 \*\*\* | 0.006 |
| Oils | 0.08 | 0.001 | 0.07 | 0.004 | 0.08 \* | 0.003 | 0.07 | 0.004 | 0.08 \*\*\* | 0.003 |
| Added Sugars | 0.38 | 0.007 | 0.42 | 0.01 | 0.34 \*\*\* | 0.01 | 0.35 | 0.02 | 0.38 \* | 0.01 |
| Discretionary Fats | 0.19 | 0.002 | 0.19 | 0.004 | 0.18 \* | 0.003 | 0.18 | 0.006 | 0.19 \*\* | 0.004 |

a All analyses were adjusted using appropriate cluster, stratum, and sample weights for the complex survey design. Analyses comparing mean intakes between smokers vs. non-smokers and men vs. women were also adjusted for energy intake.

\*\*\* p≤0.0001

\*\* p<0.01

\* p<0.05

**Supplemental Figure 1**: Steps for calculating the probability of nutrient adequacy

Divide Population into Relevant Age and Sex Groups

7,470 Total Nutrient Files (2 days) 2003-2006

Men 19-50 years

Men >50 years

Women >50 years

Women 19-50 years

Compile Key Variables

Mean nutrient intakes

Calculate the mean nutrient intake for 15 nutrients of interest using 2 24-hour recalls and estimate usual nutrient intake

Estimated Average Requirement (EAR)

Age- and gender- specific usual intake of a given nutrient that is anticipated to meet the needs of 50% of the population1

Coefficient of Variation (COV)

Taken from published tables for the US population, it is the standard deviation divided by the square root of n

Standard Deviation of the Requirement

Calculated by multiplying the EAR by the COV

Within-Person Standard Deviation

An estimation of within-person variation in intakea

Generate z-score for each individual

= 0.08



**Sample Using Mean 2-day Vitamin A Intake for Men 19-50**

z-score= 691.7– 625 \_

√(125)2+ (1160)2/2

PROBNORM was used to compute the individual probability of adequacy

The probability of adequacy associated with a z-score of 0.08 is 0.53, thus we are 53% confident that this man’s intake meets his requirement for vitamin A

a Within-subject variation estimates were taken from published Dietary Reference Intake Tables (Appendix I)([44](#_ENREF_44))