**Supplemental Tables**

**Supplemental Table 1** Pre- and post- Nutrition Label Reform daily values

|  |  |  |
| --- | --- | --- |
|  | Pre-NLR DV(1) | Post-NLR DV(2) |
| Vitamin A | 5,000 IU | 900 μg RAE\* |
| Vitamin C | 60 mg | 90 mg |
| Thiamin | 1.5 mg | 1.2 mg |
| Riboflavin | 1.7 mg | 1.3 mg |
| Niacin | 20 mg | 16 mg NE† |
| Vitamin B6 | 2 mg | 1.7 mg |
| Folate | 400 μg | 400 μg DFE‡ |
| Vitamin B12 | 6 μg | 2.4 μg |
| Zinc | 15 mg | 11 mg |
| Vitamin D | 400 IU | 20 μg§ |
| Calcium | 1000 mg | 1300 mg |
| Iron | 18 mg | 18 mg |

DFE, dietary folate equivalents; DV, daily value; IU, international units; NE, niacin equivalents; NLR, Food and Drug Administration Nutrition Label Reform; RAE, retinol activity equivalents.

\*1 RAE = 1 µg retinol, 12 µg β-carotene, 24 µg α-carotene or 24 µg β-cryptoxanthin.

† 1 NE = 1 mg niacin = 60 mg of tryptophan.

‡ 1 μg DFE = 1 µg food folate = 0.6 µg folic acid from fortified food or supplement.

§ For vitamin D 1 μg = 40 IU.

**Supplemental Table 2a** Percentage below the Estimated Average Requirement (EAR) for the total population and for ready-to-eat cereal eaters: results for children and toddlers\*

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total Population | | | | | | | | | | | | |
| Nutrients | Toddlers 1 to 3y, n=559 | | | | | | Children 4 to 12y, n=1540 | | | | | |
| Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | | Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | |
| below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % |
| Vitamin A | 0.3 | 0.3 | 1.1 | 0.7 | 0.6 | 0.5 | 9.9 | 2.3 | 16.6 | 2.9 | 13.9 | 2.5 |
| Vitamin C | 0.3 | 0.3 | 0.5 | 0.5 | 0.3 | 0.3 | 8.0 | 2.0 | 9.2 | 2.1 | 8.4 | 2.0 |
| Vitamin D | 81.2 | 2.7 | 83.7 | 2.8 | 81.3 | 2.7 | 96.7 | 0.9 | 97.7 | 0.7 | 96.7 | 0.8 |
| Thiamin | 0 | 0.1 | 0.1 | 0.2 | 0 | 0.1 | 0.1 | 0.1 | 0.4 | 0.3 | 0.2 | 0.2 |
| Riboflavin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.1 | 0.2 | 0.1 | 0.2 |
| Niacin | 0.3 | 0.4 | 0.5 | 0.7 | 0.4 | 0.6 | 0 | 0 | 0.1 | 0.1 | 0 | 0.1 |
| Vitamin B6 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0.3 | 1.1 | 0.6 | 0.5 | 0.4 |
| Folate | 0.3 | 0.3 | 0.5 | 0.6 | 0.4 | 0.4 | 0.3 | 0.6 | 3.3 | 1.4 | 1.3 | 1.1 |
| Vitamin B12 | 0 | 0 | 0 | 0.1 | 0 | 0.1 | 0 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| Calcium | 3.0 | 1.2 | 3.4 | 1.2 | 3.1 | 1.2 | 41.9 | 3.4 | 43.8 | 3.4 | 42.1 | 3.4 |
| Iron | 0.1 | 0.1 | 0.2 | 0.5 | 0.1 | 0.2 | 0 | 0.1 | 0.5 | 0.4 | 0.1 | 0.2 |
| Zinc | 0 | 0 | 0 | 0 | 0 | 0 | 2.2 | 2.6 | 7.5 | 2.7 | 3.4 | 3.0 |
| RTE Cereal Eaters|| | | | | | | | | | | | | |
|  | Toddlers 1 to 3y, n=237 | | | | | | Children 4 to 12y, n=589 | | | | | |
| Vitamin A | 0.2 | 0.3 | 2.6 | 1.9 | 0.9 | 0.9 | 1.8 | 1.1 | 12.0 | 2.6 | 5.3 | 1.6 |
| Vitamin C | 0.1 | 0.2 | 0.3 | 0.5 | 0 | 0.2 | 5.2 | 2.4 | 8.2 | 3.3 | 5.7 | 2.6 |
| Vitamin D | 80.6 | 4.0 | 86.9 | 3.3 | 80.8 | 3.9 | 87.2 | 3.3 | 94.3 | 2.1 | 87.8 | 3.1 |
| Thiamin | 0 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0.3 | 0.3 | 0 | 0.1 |
| Riboflavin | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.1 | 0 | 0.1 |
| Niacin | 0 | 0 | 0.3 | 0.9 | 0.1 | 0.4 | 0 | 0 | 0.1 | 0.2 | 0 | 0.1 |
| Vitamin B6 | 0 | 0 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0.1 | 0.3 | 0 | 0.1 |
| Folate | 0 | 0 | 0.4 | 0.7 | 0 | 0.2 | 0 | 0.1 | 4.4 | 2.3 | 1.0 | 1.3 |
| Vitamin B12 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.3 | 0.3 | 0 | 0.1 |
| Calcium | 2.1 | 1.9 | 3.7 | 2.4 | 2.3 | 2.0 | 30.2 | 1.7 | 35.8 | 1.9 | 30.7 | 1.7 |
| Iron | 0 | 0 | 0.3 | 0.9 | 0 | 0.2 | 0 | 0.1 | 0.5 | 0.9 | 0 | 0.3 |
| Zinc | 0 | 0 | 0 | 0.1 | 0 | 0 | 0.1 | 0.6 | 5.1 | 3.0 | 0.3 | 0.9 |

EAR, estimated average requirement; SE, standard error; RTE, ready-to-eat.

\* Data are from the National Health and Nutrition Examination Survey (NHANES) 2013-2014 excluding pregnant and lactating women using self-reported food intake from day one 24-hour food recalls.

† Baseline values represent NHANES 2013-2014 nutrient intakes.

‡ For the zero fortification, we modeled removing all fortification of the nutrients listed in this table.

§ In the optimized fortification scenario, we modeled fortification levels of 10% of the daily value for vitamins A, C and D, riboflavin, niacin and calcium, and 20% of the daily value for thiamin, vitamins B6 and B12, folic acid, iron and zinc.

**||** RTE cereal eaters are individuals who reported consuming any quantity of RTE cereal on Day 1 of their 24-hour dietary recall from the National Health and Nutrition Examination Survey (NHANES) 2013-2014.

**Supplemental Table 2b** Percentage below the Estimated Average Requirement (EAR) for the total population and for ready-to-eat cereal eaters: results for teens and adults\*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total Population | | | | | | | | | | | | | | |
|  | Teens 13 to 18y, n=992 | | | | | | | Adults ≥19 years, n=5076 | | | | | | p value|| |
| Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | | | Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | |
| below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | | SE, % | below EAR, % | SE, % | below EAR, % | SE, % |
| Vitamin A | 48.4 | 4.2 | 60.4 | 4.6 | 56.3 | 3.9 | 45.1 | | 1.7 | 52.8 | 1.8 | 49.6 | 1.8 | <0.0001 |
| Vitamin C | 41.0 | 8.3 | 44.4 | 7.5 | 42.8 | 8.6 | 48.8 | | 1.5 | 50.9 | 1.5 | 49.3 | 1.4 | <0.0001 |
| Vitamin D | 91.5 | 1.5 | 94.0 | 1.2 | 91.5 | 1.5 | 94.5 | | 0.8 | 95.9 | 0.7 | 94.6 | 0.8 | <0.0001 |
| Thiamin | 10.7 | 3.3 | 15.9 | 2.8 | 13.6 | 3.1 | 7.6 | | 1.1 | 10.5 | 1.2 | 8.8 | 1.2 | NC |
| Riboflavin | 7.6 | 3.0 | 10.3 | 3.3 | 9.7 | 3.4 | 3.2 | | 0.6 | 4.0 | 0.7 | 3.7 | 0.7 | NC |
| Niacin | 3.6 | 2.3 | 7.0 | 2.7 | 6.1 | 2.7 | 1.2 | | 0.2 | 2.0 | 0.3 | 1.7 | 0.3 | NC |
| Vitamin B6 | 9.6 | 4.2 | 17.8 | 3.4 | 13.9 | 4.0 | 10.3 | | 0.9 | 15.7 | 1.0 | 12.7 | 0.9 | NC |
| Folate | 18.2 | 3.8 | 30.4 | 3.4 | 26.7 | 3.3 | 13.8 | | 1.4 | 22.4 | 1.3 | 19.0 | 1.4 | <0.0001 |
| Vitamin B12 | 7.9 | 2.8 | 12.1 | 3.4 | 11.2 | 3.3 | 5.3 | | 0.8 | 7.9 | 0.7 | 6.9 | 0.7 | NC |
| Calcium | 61.6 | 2.5 | 63.1 | 2.4 | 61.7 | 2.5 | 43.7 | | 1.5 | 44.9 | 1.4 | 44.0 | 1.5 | <0.0001 |
| Iron | 10.4 | 3.2 | 18.0 | 3.3 | 13.5 | 3.0 | 3.4 | | 0.5 | 6.0 | 0.5 | 4.2 | 0.5 | <0.0001 |
| Zinc | 26.1 | 4.1 | 36.2 | 3.7 | 30.2 | 4.0 | 18.9 | | 1.7 | 24.4 | 1.3 | 20.7 | 1.5 | NC |
| RTE Cereal Eaters ¶ | | | | | | | | | | | | | | |
|  | Teens 13 to 18y, n=247 | | | | | | Adults ≥19y, n=921 | | | | | | |  |
| Vitamin A | 8.5 | 2.9 | 48.6 | 8.4 | 29.7 | 10.7 | 7.2 | | 1.9 | 38.0 | 3.8 | 21.6 | 3.4 | <0.0001 |
| Vitamin C | 31.7 | 10.6 | 54.0 | 9.4 | 38.6 | 9.9 | 39.0 | | 2.8 | 49.3 | 2.9 | 42.2 | 2.7 | <0.0001 |
| Vitamin D | 69.2 | 6.5 | 86.1 | 6.0 | 69.7 | 6.6 | 83.1 | | 4.5 | 92.5 | 2.9 | 83.8 | 4.3 | <0.0001 |
| Thiamin | 0.3 | 0.4 | 15.4 | 3.2 | 2.5 | 1.8 | 1.2 | | 0.9 | 15.1 | 2.1 | 5.3 | 1.9 | NC |
| Riboflavin | 0.1 | 0.2 | 1.2 | 1.1 | 0.7 | 0.9 | 0.1 | | 0.1 | 1.5 | 0.6 | 0.8 | 0.4 | NC |
| Niacin | 0.1 | 0.2 | 5.5 | 4.5 | 1.4 | 2.1 | 0.1 | | 0.1 | 3.2 | 1.6 | 1.6 | 1.1 | NC |
| Vitamin B6 | 0.1 | 0.2 | 17.3 | 5.3 | 1.9 | 1.9 | 0.5 | | 0.4 | 16.6 | 2.7 | 4.4 | 1.2 | NC |
| Folate | 0.3 | 0.6 | 33.8 | 6.2 | 13.9 | 4.8 | 0.2 | | 0.1 | 27.5 | 2.6 | 10.7 | 1.8 | NC |
| Vitamin B12 | 0.2 | 0.2 | 4.7 | 1.9 | 1.8 | 1.0 | 0.5 | | 0.4 | 4.4 | 1.4 | 1.6 | 0.8 | NC |
| Calcium | 36.8 | 4.5 | 44.1 | 4.4 | 37.4 | 4.5 | 27.4 | | 3.3 | 36.1 | 3.1 | 29.0 | 3.2 | <0.0001 |
| Iron | 0.2 | 0.2 | 24.2 | 5.7 | 1.4 | 1.6 | 0 | | 0 | 8.0 | 1.6 | 0.6 | 0.5 | NC |
| Zinc | 3.2 | 2.3 | 36.0 | 8.3 | 10.0 | 6.6 | 3.8 | | 1.7 | 25.1 | 3.6 | 9.6 | 2.3 | NC |

EAR, estimated average requirement; NC, not calculable; RTE, ready-to-eat; SE, standard error.

\* Data are from the National Health and Nutrition Examination Survey (NHANES) 2013-2014 excluding pregnant and lactating women using self-reported food intake from day one 24-hour food recalls.

† Baseline values represent NHANES 2013-2014 nutrient intakes.

‡ For the zero fortification, we modeled removing all fortification of the nutrients listed in this table.

§ In the optimized fortification scenario, we modeled fortification levels of 10% of the daily value for vitamins A, C and D, riboflavin, niacin and calcium, and 20% of the daily value for thiamin, vitamins B6 and B12, folic acid, iron and zinc.

¶ RTE cereal eaters are individuals who reported consuming any quantity of RTE cereal on Day 1 of their 24-hour dietary recall from the National Health and Nutrition Examination Survey (NHANES) 2013-2014.

**||** p values were calculated comparing the baseline results for toddlers (Supplemental Table 2a), children (Supplemental Table 2a), teens, and adults using an approximate chi-square test. In cases with very low estimates and standard errors, normal approximations would not be appropriate, and p-values were not calculated.

**Supplemental Table 3** Percent below Estimated Average Requirement (EAR) for total population and ready-to-eat cereal eaters ≥1 year: results for females and males\*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Nutrients | Total Population | | | | | | | | | | | | p value|| |
| Female n=4122 | | | | | | Male n=4045 | | | | | |
| Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | | Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | |
| below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % | below EAR, % | SE, % |
| Vitamin A | 39.0 | 2.3 | 45.8 | 2.4 | 43.1 | 2.4 | 40.1 | 1.7 | 48.7 | 1.6 | 44.9 | 1.6 | 0.70 |
| Vitamin C | 39.2 | 1.9 | 41.2 | 1.9 | 39.7 | 1.9 | 43.6 | 1.6 | 45.7 | 1.5 | 44.3 | 1.7 | 0.08 |
| Vitamin D | 97.3 | 0.5 | 98.1 | 0.4 | 97.4 | 0.5 | 89.5 | 1.4 | 91.9 | 1.2 | 89.6 | 1.4 | <0.0001 |
| Thiamin | 9.9 | 1.6 | 14.3 | 1.6 | 11.9 | 1.7 | 3.7 | 0.5 | 4.7 | 0.7 | 4.1 | 0.6 | 0.0002 |
| Riboflavin | 3.4 | 0.7 | 4.5 | 0.8 | 4.1 | 0.8 | 2.9 | 0.5 | 3.3 | 0.5 | 3.2 | 0.5 | 0.56 |
| Niacin | 2.1 | 0.5 | 3.7 | 0.8 | 3.1 | 0.7 | 0.5 | 0.2 | 0.7 | 0.3 | 0.6 | 0.2 | 0.003 |
| Vitamin B6 | 13.1 | 1.2 | 21.6 | 1.6 | 17.1 | 1.3 | 3.8 | 0.7 | 6.1 | 1.0 | 4.6 | 0.9 | <0.0001 |
| Folate | 17.8 | 1.9 | 29.9 | 1.8 | 25.8 | 1.8 | 6.5 | 0.9 | 10.6 | 1.1 | 8.5 | 1.0 | <0.0001 |
| Vitamin B12 | 6.9 | 1.3 | 11.6 | 1.8 | 9.9 | 1.7 | 1.7 | 0.5 | 2.3 | 0.6 | 2.1 | 0.6 | 0.0002 |
| Calcium | 58.0 | 1.7 | 59.4 | 1.6 | 58.3 | 1.7 | 29.8 | 1.1 | 30.8 | 1.2 | 30.0 | 1.1 | <0.0001 |
| Iron | 6.3 | 1.0 | 11.3 | 0.9 | 8.1 | 1.0 | 0.6 | 0.2 | 0.9 | 0.3 | 0.7 | 0.2 | <0.0001 |
| Zinc | 18.7 | 1.7 | 25.2 | 1.5 | 20.7 | 1.6 | 15.2 | 1.8 | 19.6 | 1.7 | 16.6 | 1.7 | 0.16 |
|  | RTE Cereal Eaters¶ | | | | | | | | | | | |  |
| Female n= 1003 | | | | | | Male n=991 | | | | | |
| Vitamin A | 9.1 | 3.3 | 35.4 | 3.6 | 23.1 | 4.1 | 2.5 | 3.0 | 26.6 | 5.7 | 11.7 | 5.9 | 0.14 |
| Vitamin C | 27.4 | 3.4 | 37.6 | 3.9 | 30.5 | 3.3 | 30.6 | 2.6 | 38.9 | 3.1 | 33.1 | 2.8 | 0.45 |
| Vitamin D | 93.7 | 2.7 | 97.1 | 1.6 | 93.7 | 2.6 | 71.0 | 4.7 | 85.9 | 3.5 | 72.0 | 4.6 | <0.0001 |
| Thiamin | 1.3 | 1.1 | 16.5 | 2.5 | 6.3 | 2.5 | 0.2 | 0.1 | 6.0 | 1.3 | 1.2 | 0.4 | 0.32 |
| Riboflavin | 0.1 | 0.1 | 1.8 | 0.8 | 1.0 | 0.5 | 0 | 0 | 0.4 | 0.3 | 0.2 | 0.2 | NC |
| Niacin | 0.1 | 0.2 | 4.9 | 2.5 | 2.5 | 1.6 | 0 | 0 | 0.6 | 0.5 | 0.2 | 0.2 | NC |
| Vitamin B6 | 0.5 | 0.4 | 21.7 | 3.9 | 5.8 | 1.7 | 0 | 0 | 3.2 | 1.9 | 0.3 | 0.3 | NC |
| Folate | 0.2 | 0.2 | 31.7 | 2.0 | 13.9 | 2.5 | 0 | 0 | 12.2 | 2.4 | 3.5 | 0.9 | NC |
| Vitamin B12 | 0 | 0 | 6.5 | 2.2 | 2.4 | 1.3 | 0 | 0 | 0.6 | 0.5 | 0.2 | 0.2 | NC |
| Calcium | 39.5 | 4.1 | 47.7 | 3.7 | 40.9 | 3.7 | 16.3 | 1.9 | 22.1 | 2.2 | 17.1 | 1.8 | <0.0001 |
| Iron | 0 | 0.1 | 13.2 | 2.3 | 1.0 | 0.6 | 0 | 0 | 1.7 | 0.7 | 0.1 | 0.1 | NC |
| Zinc | 3.0 | 1.4 | 24.7 | 3.5 | 8.5 | 2.0 | 2.5 | 1.1 | 15.8 | 3.0 | 5.8 | 1.4 | 0.78 |

EAR, estimated average requirement; NC, not calculable; RTE, ready-to-eat; SE, standard error.

\* Data are from the National Health and Nutrition Examination Survey (NHANES) 2013-2014 excluding pregnant and lactating women using self-reported food intake from day one 24-hour food recalls.

† Baseline values represent NHANES 2013-2014 nutrient intakes.

‡ For the zero fortification, we modeled removing all fortification of the nutrients listed in this table.

§ In the optimized fortification scenario, we modeled fortification levels of 10% of the daily value for vitamins A, C and D, riboflavin, niacin and calcium, and 20% of the daily value for thiamin, vitamins B6 and B12, folic acid, iron and zinc.

**||** p values were calculated comparing the baseline results for females and males using an approximate chi-square test. In cases with very low estimates and standard errors, normal approximations would not be appropriate, and p-values were not calculated.

¶ RTE cereal eaters are individuals who reported consuming any quantity of RTE cereal on Day 1 of their 24-hour dietary recall from the National Health and Nutrition Examination Survey (NHANES) 2013-2014.

**Supplemental Table 4a** Percentage above the Upper Tolerable Intake Level (UL) for the total population and for ready-to-eat cereal eaters: results for children and toddlers**\***

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total Population | | | | | | | | | | | | |
| Nutrients | Toddlers 1 to 3y, n=559 | | | | | | Children 4 to 12y, n=1540 | | | | | |
| Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | | Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | |
| Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % |
| Retinol | 19.0 | 2.4 | 8.1 | 1.7 | 10.2 | 2.1 | 0.9 | 0.5 | 0.2 | 0.2 | 0.2 | 0.2 |
| Vitamin C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vitamin D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Niacin|| | 29.6 | 4.0 | 6.1 | 2.1 | 9.1 | 2.9 | 10.0 | 3.1 | 0.2 | 0.3 | 0.3 | 0.5 |
| Vitamin B6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Folic Acid | 6.6 | 2.3 | 0 | 0 | 0.1 | 0.1 | 0.4 | 0.3 | 0 | 0 | 0 | 0 |
| Calcium | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Iron | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zinc | 59.9 | 3.6 | 33.9 | 3.6 | 45.3 | 2.6 | 3.7 | 1.2 | 0.8 | 0.4 | 1.4 | 0.7 |
| RTE Cereal Eaters¶ | | | | | | | | | | | | |
|  | Toddlers 1 to 3y, n=237 | | | | | | Children 4 to 12y, n=589 | | | | | |
| Retinol | 32.6 | 5.0 | 8.0 | 2.4 | 13.0 | 3.2 | 3.8 | 1.4 | 0.2 | 0.2 | 0.4 | 0.4 |
| Vitamin C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Vitamin D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Niacin|| | 63.8 | 6.9 | 4.0 | 3.3 | 10.1 | 5.4 | 37.8 | 5.0 | 0.1 | 0.7 | 0.7 | 1.5 |
| Vitamin B6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Folic Acid | 28.9 | 5.3 | 0 | 0 | 0.4 | 0.5 | 7.6 | 1.7 | 0 | 0 | 0 | 0 |
| Calcium | 0 | 0.1 | 0 | 0.1 | 0 | 0.1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Iron | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zinc | 81.4 | 8.5 | 30.1 | 5.3 | 56.6 | 5.1 | 14.5 | 2.4 | 1.1 | 0.6 | 5.2 | 1.8 |

RTE, ready-to-eat; SE, standard error; UL, upper tolerable level.

\* Data are from the National Health and Nutrition Examination Survey (NHANES) 2013-2014 excluding pregnant and lactating women using self-reported food intake from day one 24-hour food recalls.

† Baseline values represent NHANES 2013-2014 nutrient intakes.

‡ For the zero fortification, we modeled removing all fortification of the nutrients listed in this table.

§ In the optimized fortification scenario, we modeled fortification levels of 10% of the daily value for vitamins A, C and D, riboflavin, niacin and calcium, and 20% of the daily value for thiamin, vitamins B6 and B12, folic acid, iron and zinc.

**||** Using the Food and Nutrient Database for Dietary Studies (FNDDS) 2013-2014, we considered 100% Niacin from fortification for fortified foods, 0% from unfortified and 75% from partially fortified foods.

¶ RTE cereal eaters are individuals who reported consuming any quantity of RTE cereal on Day 1 of their 24-hour dietary recall from the National Health and Nutrition Examination Survey (NHANES) 2013-2014.

**Supplemental Table 4b** Percentage above the Upper Tolerable Level (UL) for the total population and for ready-to-eat cereal eaters: results for teens and adults\*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total Population | | | | | | | | | | | | | p value|| |
| Nutrients | Teens 13-18 years, n=992 | | | | | | Adults ≥19 years, n=5076 | | | | | |
| Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | | Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | |
| Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % |
| Retinol | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Vitamin C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Vitamin D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Niacin¶ | 6.2 | 1.7 | 1.4 | 1.1 | 1.7 | 1.1 | 0.6 | 0.2 | 0.2 | 0.1 | 0.2 | 0.1 | <0.0001 |
| Vitamin B6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Folic Acid | 0.1 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Calcium | 0.1 | 0.1 | 0 | 0.1 | 0.1 | 0.1 | 0.3 | 0 | 0.3 | 0 | 0.3 | 0 | NC |
| Iron | 0.1 | 0.2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Zinc | 0.2 | 0.3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| RTE Cereal Eaters\*\* | | | | | | | | | | | | |  |
|  | Teems 13 to 18y, n=247 | | | | | | Adults ≥19y, n=921 | | | | | |
| Retinol | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Vitamin C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Vitamin D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Niacin¶ | 63.8 | 6.9 | 4.0 | 3.3 | 10.1 | 5.4 | 2.0 | 0.8 | 0 | 0 | 0 | 0.1 | <0.0001 |
| Vitamin B6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Folic Acid | 28.9 | 5.3 | 0 | 0 | 0.4 | 0.5 | 0.1 | 0.1 | 0 | 0 | 0 | 0 | <0.0001 |
| Calcium | 0 | 0.1 | 0 | 0.1 | 0 | 0.1 | 0.7 | 0.3 | 0.5 | 0.2 | 0.7 | 0.3 | NC |
| Iron | 0 | 0 | 0 | 0 | 0 | 0 | 0.5 | 0.4 | 0 | 0 | 0 | 0 | NC |
| Zinc | 81.4 | 8.5 | 30.1 | 5.3 | 56.6 | 5.1 | 0 | 0 | 0 | 0 | 0 | 0 | NC |

RTE, ready-to-eat; NC, not calculable; SE, standard error; UL, upper tolerable level.

\* Data are from the National Health and Nutrition Examination Survey (NHANES) 2013-2014 excluding pregnant and lactating women using self-reported food intake from day one 24-hour food recalls.

† Baseline values represent NHANES 2013-2014 nutrient intakes.

‡ For the zero fortification, we modeled removing all fortification of the nutrients listed in this table.

§ In the optimized fortification scenario, we modeled fortification levels of 10% of the daily value for vitamins A, C and D, riboflavin, niacin and calcium, and 20% of the daily value for thiamin, vitamins B6 and B12, folic acid, iron and zinc.

|| p values were calculated comparing the baseline results for toddlers (Supplemental Table 4a), children (Supplemental Table 4a), teens, and adults using an approximate chi-square test. In cases with very low estimates and standard errors, normal approximations would not be appropriate, and p-values were not calculated.

¶ Using the FNDDS 2013-2014, we considered 100% Niacin from fortification for fortified foods, 0% from unfortified and 75% from partially fortified foods.

\*\* RTE cereal eaters are individuals who reported consuming any quantity of RTE cereal on Day 1 of their 24-hour dietary recall from the National Health and Nutrition Examination Survey (NHANES) 2013-2014.

**Supplemental Table 5** Percent above the Upper Tolerable Intake Level (UL) for total population and ready-to-eat cereal eaters ≥1 year: results for females and males\*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Nutrients | Total Population | | | | | | | | | | | | p value|| |
| Female n= 4122 | | | | | | Male n=4045 | | | | | |
| Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | | Baseline† | | Zero Fortification‡ | | Optimized Fortification§ | |
|  | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % | Above UL, % | SE, % |
| Retinol | 0.9 | 0.3 | 0.3 | 0.1 | 0.4 | 0.2 | 0.9 | 0.2 | 0.4 | 0.1 | 0.5 | 0.1 | 1.0 |
| Vitamin C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Vitamin D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Niacin¶ | 2.3 | 0.5 | 0.3 | 0.1 | 0.4 | 0.2 | 4.9 | 1.2 | 1.2 | 0.5 | 1.4 | 0.5 | 0.05 |
| Vitamin B6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Folic Acid | 0.5 | 0.1 | 0 | 0 | 0 | 0 | 0.2 | 0.1 | 0 | 0 | 0 | 0 | 0.03 |
| Calcium | 0 | 0 | 0 | 0 | 0 | 0 | 0.8 | 0.2 | 0.7 | 0.2 | 0.7 | 0.2 | <0.0001 |
| Iron | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Zinc | 2.7 | 0.4 | 1.4 | 0.2 | 1.9 | 0.3 | 3.0 | 0.6 | 1.5 | 0.4 | 2.0 | 0.4 | 0.68 |
|  | RTE Cereal Eaters\*\* | | | | | | | | | | | |  |
| Females n=1003 | | | | | | Males n=991 | | | | | |
| Retinol | 3.4 | 1.4 | 0.6 | 0.4 | 1.1 | 0.7 | 2.9 | 0.5 | 0.7 | 0.2 | 1.1 | 0.3 | 0.74 |
| Vitamin C | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Vitamin D | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Niacin¶ | 10.9 | 1.7 | 0.1 | 0.3 | 0.6 | 0.7 | 22.4 | 4.5 | 0.7 | 0.3 | 1.5 | 0.6 | 0.02 |
| Vitamin B6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | NC |
| Folic Acid | 4.4 | 0.7 | 0 | 0 | 0 | 0 | 4.0 | 0.8 | 0 | 0 | 0 | 0.1 | 0.71 |
| Calcium | 0.1 | 0.1 | 0 | 0 | 0.1 | 0.1 | 0.9 | 0.3 | 0.7 | 0.2 | 0.9 | 0.3 | 0.01 |
| Iron | 0 | 0 | 0 | 0 | 0 | 0 | 1.7 | 1.1 | 0 | 0 | 0 | 0 | 0.12 |
| Zinc | 9.5 | 1.6 | 2.9 | 0.4 | 5.7 | 1.1 | 9.5 | 1.3 | 2.0 | 0.7 | 4.6 | 0.9 | 1.0 |

RTE, ready-to-eat; NC, not calculable; SE, standard error; UL, upper tolerable level.

\* Data are from the National Health and Nutrition Examination Survey (NHANES) 2013-2014 excluding pregnant and lactating women using self-reported food intake from day one 24-hour food recalls.

† Baseline values represent NHANES 2013-2014 nutrient intakes.

‡ For the zero fortification, we modeled removing all fortification of the nutrients listed in this table.

§ In the optimized fortification scenario, we modeled fortification levels of 10% of the daily value for vitamins A, C and D, riboflavin, niacin and calcium, and 20% of the daily value for thiamin, vitamins B6 and B12, folic acid, iron and zinc.

|| p values were calculated comparing the baseline results females and males using an approximate chi-square test. In cases with very low estimates and standard errors, normal approximations would not be appropriate, and p-values were not calculated.

¶ Using the FNDDS 2013-2014, we considered 100% Niacin from fortification for fortified foods, 0% from unfortified and 75% from partially fortified foods.

\*\* RTE cereal eaters are individuals who reported consuming any quantity of RTE cereal on Day 1 of their 24-hour dietary recall from the National Health and Nutrition Examination Survey (NHANES) 2013-2014.

**References**

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