

Nutrient intake differs among persons with celiac disease and gluten-related disorders in the United States

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**Supplementary Table 1.** Unadjusted mean (SE) micronutrient intake from food and supplements among NHANES participants 20 years and older with and without celiac disease and PWAG, United States, 2009-2014

| Micronutrient             | Diagnosed celiac disease<br>(N=26) |                       | Undiagnosed celiac disease<br>(N=80) |                       | PWAG<br>(N=178) |                       | Controls<br>(N=14,433) |                       |
|---------------------------|------------------------------------|-----------------------|--------------------------------------|-----------------------|-----------------|-----------------------|------------------------|-----------------------|
|                           | Food Only                          | Food +<br>Supplements | Food Only                            | Food +<br>Supplements | Food Only       | Food +<br>Supplements | Food Only              | Food +<br>Supplements |
| Calcium (mg)              | 977.6 (82.7)                       | 1383.2 (156.8)        | 1282.6 (61.4)***                     | 1447.0 (72.7)***      | 977.5 (84.5)    | 1167.3 (114.4)        | 998.0 (6.2)            | 1159.1 (8.0)          |
| Phosphorus (mg)           | 1333.2 (95.2)                      | 1347.6 (95.2)         | 1723.1 (77.4)***                     | 1729.0 (77.2)***      | 1398.2 (92.3)   | 1406.8 (92.8)         | 1418.3 (6.8)           | 1425.3 (6.9)          |
| Magnesium (mg)            | 321.8 (16.2)                       | 374.9 (22.1)          | 359.7 (18.0)**                       | 392.3 (17.4)**        | 367.1 (30.9)    | 424.4 (55.9)          | 310.3 (2.2)            | 336.7 (2.6)           |
| Iron (mg)                 | 14.1 (2.4)                         | 20.4 (3.6)            | 18.4 (1.0)**                         | 23.5 (1.4)**          | 14.7 (1.2)      | 18.1 (1.5)            | 15.3 (0.1)             | 18.9 (0.2)            |
| Zinc (mg)                 | 10.1 (0.7)*                        | 15.9 (2.2)            | 14.6 (0.7)***                        | 18.9 (1.0)**          | 11.8 (0.8)      | 16.0 (1.7)            | 11.6 (0.1)             | 15.7 (0.1)            |
| Copper (mg)               | 1.4 (0.1)                          | 1.8 (0.2)             | 1.6 (0.1)**                          | 2.0 (0.1)**           | 1.6 (0.1)       | 1.8 (0.2)             | 1.3 (0.01)             | 1.6 (0)               |
| Sodium (mg)               | 3063.4 (318.7)                     | 3063.6 (319.0)        | 4127.3 (208.6)*                      | 4127.5 (208.5)*       | 3363.3 (194.7)  | 3370.1 (194.9)        | 3582.6 (16.4)          | 3584.7 (16.5)         |
| Potassium (mg)            | 2836.5 (247.0)                     | 2862.2 (248.6)        | 3244.1 (107.2)***                    | 3262.9 (108.3)***     | 3141.3 (308.2)  | 3183.8 (312.3)        | 2752.4 (17.4)          | 2767.2 (17.5)         |
| Selenium (mcg)            | 96.8 (7.9)*                        | 117.1 (12.3)          | 132.4 (7.9)*                         | 148.7 (9.1)           | 105.6 (5.2)     | 119.8 (8.0)           | 115.5 (0.7)            | 132.6 (0.9)           |
| Vitamin A (mcg)†          | 828.9 (82.1)*                      | --                    | 893.6 (69.2)**                       | --                    | 794.5 (125.4)   | --                    | 652.0 (9.4)            | --                    |
| Vitamin B-6 (mg)          | 2.3 (0.3)                          | 5.5 (1.4)             | 2.5 (0.1)**                          | 4.7 (0.3)             | 2.3 (0.2)       | 5.4 (0.9)             | 2.2 (0.2)              | 4.4 (0.1)             |
| Vitamin B-12 (mcg)        | 5.5 (0.8)                          | 35.3 (15.9)           | 7.5 (0.9)*                           | 30.0 (4.4)            | 4.4 (0.3)*      | 24.7 (7.6)            | 5.2 (0.1)              | 23.3 (1.1)            |
| Vitamin C (mg)            | 103.8 (24.3)                       | 198.1 (45.9)          | 82.0 (8.9)                           | 160.6 (24.4)          | 121.0 (17.3)    | 262.0 (52.5)*         | 84.5 (1.6)             | 157.8 (3.7)           |
| Vitamin D (mcg)‡          | 6.2 (0.7)                          | 22.6 (4.4)            | 5.8 (0.5)*                           | 16.0 (1.5)            | 3.9 (0.3)**     | 17.0 (3.1)            | 4.8 (0.1)              | 14.0 (0.3)            |
| Vitamin E (mg)†           | 11.0 (1.0)*                        | --                    | 9.3 (0.7)                            | --                    | 11.5 (1.3)      | --                    | 8.8 (0.1)              | --                    |
| Vitamin K (mcg)           | 160.6 (38.0)                       | 182.2 (40.1)          | 106.6 (8.6)                          | 114.0 (9.3)           | 174.6 (38.1)    | 183.1 (40.1)          | 115.2 (2.0)            | 122.9 (2.2)           |
| Beta-carotene (mcg)†      | 4013.4 (862.0)                     | --                    | 2734.8 (378.3)                       | --                    | 4238.1 (797.8)* | --                    | 2326.4 (58.9)          | --                    |
| Alpha-carotene (mcg)†     | 1236.7 (326.0)                     | --                    | 843.2 (116.6)*                       | --                    | 935.8 (341.5)   | --                    | 566.9 (19.3)           | --                    |
| Beta-cryptoxanthin (mcg)† | 121.1 (19.6)                       | --                    | 101.1 (15.0)                         | --                    | 100.1 (14.3)    | --                    | 89.8 (2.2)             | --                    |
| Lycopene (mcg)            | 5004.8 (1646.1)                    | 5745.4 (1907.8)       | 8861.0 (1177.9)                      | 9835.8 (1364.7)       | 6607.9 (828.6)  | 6989.2 (800.6)        | 7128.3 (159.8)         | 7771.1 (205.5)        |
| Lutein + zeaxanthin (mcg) | 2235.9 (588.3)                     | 2324.9 (619.5)        | 1595.3 (159.1)                       | 1659.7 (162.2)        | 2798.1 (561.5)* | 3007.9 (605.6)*       | 1536.6 (46.1)          | 1651.3 (52.5)         |
| Thiamin (mg)              | 1.5 (0.2)                          | 3.9 (0.8)             | 2.0 (0.1)***                         | 3.5 (0.2)             | 1.4 (0.1)*      | 3.6 (0.5)             | 1.7 (0.01)             | 3.4 (0.1)             |
| Riboflavin (mg)           | 2.4 (0.2)                          | 5.0 (1.0)             | 2.7 (0.2)**                          | 4.2 (0.2)             | 2.1 (0.1)       | 4.2 (0.6)             | 2.2 (0.01)             | 3.9 (0.1)             |
| Niacin (mg)               | 23.2 (2.9)                         | 35.1 (5.7)            | 31.3 (1.4)***                        | 42.1 (3.7)            | 23.8 (1.1)*     | 35.2 (4.1)            | 26.3 (0.2)             | 35.8 (0.4)            |

|                   |              |               |                |                |                 |                 |             |             |
|-------------------|--------------|---------------|----------------|----------------|-----------------|-----------------|-------------|-------------|
| Folic acid (mcg)  | 165.6 (51.3) | 287.5 (69.5)  | 257.3 (20.7)** | 415.5 (34.5)** | 100.4 (11.5)*** | 235.6 (21.6)*** | 192.9 (2.2) | 323.6 (3.3) |
| Folate, DFE (mcg) | 565.7 (78.7) | 782.8 (109.4) | 681.1 (42.8)** | 946.7 (66.1)*  | 510.6 (53.2)    | 749.0 (79.6)    | 553.6 (5.0) | 776.7 (6.8) |
| Choline (mg)      | 351.3 (32.6) | 352.4 (32.9)  | 411.4 (26.4)** | 411.4 (26.4)*  | 350.6 (22.4)    | 354.7 (23.3)    | 338.5 (2.1) | 339.9 (2.1) |

NHANES, National Health and Nutrition Examination Survey; PWAG, persons without celiac disease avoiding gluten; SE, standard error.

†Intake from food, but not supplements was measured.

‡Vitamin D2 + vitamin D3.

\*p<0.05, \*\*p<0.01, and \*\*\*p<0.001 compared to controls.