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Abstract

Dietary and Supplement Intake of Lutein and Zeaxanthin: How Much Do We Get and How Much Do We Need? †

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Abstract: Background and objectives: Lutein and zeaxanthin (L+Z) are carotenoids highly concentrated in the macula to maintain macular pigment optical density (MPOD) throughout the lifespan. Studies have shown that an intake of 6–20 mg or higher of L+Z would be beneficial for visual function and cognition. The human body cannot synthesize L+Z and must obtain them from other sources. Objective: To determine the nutrient intake status of L+Z in US children (6–18 years) and adults (19–64 years), and how dietary supplements contribute to the total intake level of L+Z. Methods: Data from NHANES 2003-08 cycles were used to estimate the mean intakes of L+Z from food and food + supplements (F+S). Children and adults were analyzed according to age groups: 6–8 years, 9–13 years, and 14–18 years for children, and 19–30 years, 31–50 years, and 51–64 years for adults. Results: In adults (n = 8252), the mean (SE) dietary intake of L+Z from food was 1.322 mg (0.040), which was similar to the intake from F+S: 1.396 mg (0.041). For both adult men and women, the mean intake increased by age, with the lowest intake of 1.047 mg (0.039) from food in adult women aged 19–30 years, and the highest intake of 1.700 mg (0.069) from F+S in adult men aged 51–64 years. In children (n = 7429), the mean (SE) intake of L+Z was 0.743 mg (0.026) from food, and 0.748 mg (0.026) from F+S. The intake levels among all age groups in children were similar, with the lowest intake of 0.686 mg (0.028) from food in girls 14–18 years, and the highest intake of 0.801 mg (0.038) from F+S in boys 9–13 years. Discussion: We found that the dietary intake levels of L+Z in US were much lower than levels recognized to support brain and eye health. Supplementation only marginally increased the total intake, which may indicate a lack of consumer awareness. Efforts are needed to raise public awareness of the health benefits of L+Z and encourage more consumption of L+Z-containing food (dark leafy greens and yellow or orange fruits/vegetables) and supplements by establishing dietary guidance for L+Z. This research was funded by Pharmavite LLC.

Keywords: lutein; zeaxanthin; NHANES; nutritional status; dietary intake; supplement; children; adults; visual; cognition

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Informed Consent Statement: Informed consent was obtained from NHANES participants by NCHS.

Data Availability Statement: The datasets analyzed during the current study are available in the NHANES repository at the following links: NHANES 2003–2004: https://wwwn.cdc.gov/nchs/nhanes/continuousnhanes/default.aspx?BeginYear=2003; NHANES 2005–2006: https://wwwn.cdc.gov/nchs/nhanes/continuousnhanes/default.aspx?BeginYear=2005; NHANES 2007–2008: https://wwwn.cdc.gov/nchs/nhanes/continuousnhanes/default.aspx?BeginYear=2007.

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