

Is dietary supplementation appropriate for children with autism spectrum disorder?

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Quinn, an autistic boy, and the line of toys he made before falling asleep. Repeatedly stacking or lining up objects is a behavior commonly associated with autism. Credit: Wikipedia.

Children with Autism Spectrum Disorder (ASD) are often picky eaters, which can lead parents to suspect that their children might not be getting adequate amounts of vitamins and minerals. This sometimes leads parents of children with ASD to try nutritional supplements and dietary

regimens such as gluten-free and casein-free (GFCF) diets without professional supervision. In the largest study of its kind, published in the *Journal of the Academy of Nutrition and Dietetics*, researchers report that these well-intentioned efforts can result in both insufficient nutrients and excessive nutrients. Despite supplementation, children with ASD still were deficient in calcium, for example, while some were consuming excessive amounts of vitamin A and other nutrients.

"Many families try a GFCF diet in an attempt to improve symptoms of ASD," explained lead investigator Patricia A. Stewart, PhD, RD, assistant professor of Pediatrics, the University of Rochester Medical Center. "While 19% of all Autism Speaks Autism Treatment Network (AS ATN) participants were reported to be on a GFCF diet, 12% of the [children](#) in the subgroup participating in this study were given a GFCF diet and were significantly more likely to use [nutritional supplements](#) (78% vs 53%), however, the micronutrient intake of children on or off the diet was remarkably similar."

A total of 368 children between 2 and 11 years of age were recruited from five AS ATN sites at Cincinnati Children's Hospital, University of Arkansas, University of Colorado, University of Pittsburgh, and University of Rochester. All had been diagnosed with Autistic Disorder, Asperger Disorder, or Pervasive Developmental Disorder as defined by the DSM-IV.

Three-day food records were completed for the children by their caregivers. A registered dietitian nutritionist trained the caregivers to record the amount of all foods, beverages and nutritional [supplements](#) consumed including brand names and recipes used for food preparation. In the case of nutritional supplements, photographs of the labels were taken to insure that ingredients were accurately recorded. Registered dietitian nutritionists verified these records and immediately called families if clarification was needed.

By examining these detailed eating records, investigators found that the children were consuming similar amounts of micronutrients as children without ASD. They also had the same deficits in vitamins D, E, calcium, potassium, and choline as the general pediatric population. Although ASD children are given supplements more often (56% vs. 31-37% of the general population), even after supplementation, 40-55% were lacking in calcium and 30-40% were lacking in vitamin D.

Children on the GFCF diet consumed more magnesium and vitamin E. This may be due to the substitution of soy and nut-based products. Children on this diet were more adequately supplemented with vitamin D. Calcium supplementation was equally inadequate in those on and off the diet.

Despite different eating behaviors, children with ASD received much of their needed micronutrients from food consumption. This might be due to the high levels of fortification in the modern food supply, where vitamins and minerals are often added. This fortification may also be responsible for the overconsumption of certain nutrients by children with ASD. For the supplement users in this study, many exceeded the Tolerable Upper Limit for safe intake levels of vitamin A, folic acid, and zinc.

"In clinical practice, each patient needs to be individually assessed for potential nutritional deficiencies or excess. Few children with ASD need most of the micronutrients they are commonly given as multivitamins, which often leads to excess intake that may place children at risk for adverse effects. When supplements are used, careful attention should be given to adequacy of vitamin D and calcium intake," Dr. Stewart noted.

More information: "Dietary Supplementation in Children with Autism Spectrum Disorders: Common, Insufficient and Excessive," by Patricia A. Stewart, PhD, RD; Susan L. Hyman, MD; Brianne L.

Schmidt, RD; Eric A. Macklin, PhD; Ann Reynolds, MD; Cynthia R. Johnson, PhD, BCBA-D; S. Jill James, PhD; Patricia Manning-Courtney, MD ([DOI: 10.1016/j.jand.2015.03.026](https://doi.org/10.1016/j.jand.2015.03.026)), *Journal of the Academy of Nutrition and Dietetics*.

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