

DIET RECCOMANDATIONS FOR ADHD

High level evidence from studies (Meta-analysis and RCT)

- Supplementation with omega three oils EPA 0.5 to 0.7 gr per day (omega 3 formula for kids called MorEPA MINI)
- 2) Elimination of artificial colouring (E numbers, especially blue and orange)

Moderate evidence from studies

- 1) Zinc supplementation
- 2) Magnesium supplementation
- 3) Vit D
- 4) (good supplements are WellKid immune)

Moderate evidence but non univocal:

Low GI diet:

opt for elimination of processed food (out of a packet) Reduction (better elimination) of refined sugar (juices, candies, cookies, etc) opt for simple wholemeal grains (brown rice, oat etc, less pasta, and if pasta must be opt for wholemeal pasta)

Some suggestion (extract form Additude):

What to Eat Carbs and ADHD Brain Power

Carbs affect brain function and mood. The rate at which sugar from a particular food enters brain cells, and other cells of the body, is called the "glycemic index" (GI). Foods with a high glycemic index stimulate the pancreas to secrete high levels of insulin, which causes sugar to empty quickly from the blood into the cells. Insulin regulates the ups and downs of blood sugar, and the rollercoaster behavior that sometimes goes with them.

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Low-glycemic foods deliver a steady supply of sugar, helping a person with ADHD control behavior and improve performance

Foods with the best brain sugars include:

Fruits: grapefruit, apples, cherries, oranges, and grapes. Fruits have a lower GI than do fruit juices, because fiber in fruit slows the absorption of fruit sugar. A whole apple is more brain-friendly than apple juice; a whole orange better than orange juice. Please note that the acid in oranges, **grapefruits**, and their **juices** interrupts the absorption of short-acting stimulant **ADHD medications** and should be avoided when taking these prescriptions.

Cereals and grains: oatmeal, bran, higher-fiber cereals and pastas also have a low GI. Corn flakes and sugarcoated <u>breakfast</u> cereals have higher GIs, and should be avoided.

Vegetables and legumes: legumes, such as soybeans, kidney beans, and lentils have the lowest GI of any food.

Dairy products: Milk and yogurt have low GIs, slightly higher than legumes, but lower than fruits. Plain yogurt has a lower GI than yogurt with fruit preserves or sugar added.

Protein and ADHD Brain Power

The brain makes a variety of chemical messengers, or neurotransmitters, to regulate wakefulness and sleep. Studies⁴ by Massachusetts Institute of Technology neuroscientist Richard Wurtman Ph.D., and others have shown that protein triggers alertness-inducing neurotransmitters, while carbohydrates trigger drowsiness.

These findings support the popular belief that people with ADHD do better after eating a <u>protein-rich breakfast</u> and lunch. Yet child psychologist Vincent J. Monastra, Ph.D., head of an ADHD clinic in New York says that, of the 500 children a year he evaluates for ADHD, less than 5 percent are eating the government-recommended amounts of protein at breakfast and lunch. In addition to boosting alertness, says Monastra, a protein-rich breakfast seems to reduce the likelihood that ADHD medication will cause irritability or restlessness.

Proteins affect brain performance by providing the amino acids from which <u>neurotransmitters</u> are made. Neurotransmitters are biochemical messengers that carry signals from one brain cell to another. The better you feed these messengers, the more efficiently and accurately they deliver the goods, allowing your child to be alert at school or you to be more on top of things at work.

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Two amino acids, tryptophan and tyrosine, are important building blocks of neurotransmitters. These amino acids influence the four top neurotransmitters — serotonin, which is made from the amino acid tryptophan, as well as <u>dopamine</u>, epinephrine, and norepinephrine, which are made from the amino acid tyrosine. Tryptophan is an essential amino acid. The body does not make it; it must be supplied by the diet. The body can make tyrosine if there is not enough in the diet.

"Because the body makes brain-awakening neurotransmitters when you eat protein, start your day with a <u>breakfast that includes protein</u>," says Laura Stevens, M.S., a nutritionist at Purdue University and author of *12 Effective Ways to Help Your ADD/ADHD Child*. "Also look for ways to slip in lean protein during the day, as well."

"Protein helps keep blood sugar levels steady, and prevents the mental declines that come from eating a meal containing too many simple carbs," says Ned Hallowell, M.D., author of *Driven to Distraction*.

If your family's idea of breakfast is toast, sugary cereals, or doughnuts, don't panic. You don't need to eat a plate of eggs and bacon every morning to meet your daily protein requirements. "We're not talking about a ton of food," says Monastra, author of *Parenting Children with ADHD: 10 Lessons That Medicine Cannot Teach*.

Depending on their age, children need between 24 to 30 grams of protein a day. Adults need 45 to 70 grams. You can get 7 grams in a cup of milk or soy milk, one egg, or an ounce of cheese or meat.

5 Balanced Breakfasts

A nutrition-packed breakfast should contain a balance of complex carbohydrates and protein.

Think grains, plus dairy, plus fruits. For example:

- 1. Granola cereal, yogurt, sliced apple
- 2. Scrambled eggs, whole-grain toast, orange
- 3. Veggie omelet, bran muffin, fresh fruit with yogurt
- 4. Whole-grain pancakes or waffles topped with berries and/or yogurt, milk
- 5. Low-fat cheese melted on wholegrain toast, pear

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Fat, Fish Oil, and ADHD Brain Power

"Fats make up 60 percent of the brain and the nerves that run every system in the body," says William Sears, M.D., an associate clinical professor of pediatrics at the University of California, Irvine, School of Medicine. "The better the fat in the diet, the better the brain will function."

Most important to brain function are the two essential fatty acids found in <u>fish oil</u>: linoleic (or omega 6) and alpha linolenic (or omega 3). These are the prime structural components of brain cell membranes, and an important part of the enzymes that allow cell membranes to transport nutrients in and out of cells. Western diets contain too many omega-6 fatty acids and too few of the omega 3s, which are found in cold-water fish (primarily salmon and tuna), soybeans, walnuts, wheat germ, pumpkin seeds, and eggs. Flaxseed and canola oils are good sources of omega 3s.

"Individuals with ADHD who have low levels of omega 3s will show the biggest improvement in mental focus and cognitive function when they add more of these healthy fats to their diet," says Richard Brown, M.D., associate clinical professor of psychiatry at Columbia University College of Physicians and Surgeons.

Vitamins and ADHD Brain Power

Studies⁵ indicate that children in grade school whose diets are supplemented with appropriate vitamins and minerals scored higher on intelligence tests than did those who took no supplements. This is encouraging news, but it comes with an important caveat: Genetic abnormalities such as MTHFR can make some supplements difficult, even dangerous. For this reason and others, you should always consult with your physician before introducing a new vitamin or supplement to your or your child's diet. Even the seemingly innocuous vitamin B can cause serious side effects in certain individuals.

Here are some specific vitamins and minerals that affect behavior and learning in children and adults:

Vitamin C is required by the brain to make <u>neurotransmitters</u>. In fact, the brain has a special vitamin c "pump," which draws extra vitamin c out of the blood into the brain.

Vitamin B6 deficiency causes irritability and fatigue. Adequate levels of the vitamin increase the brain's levels of the neurotransmitter <u>dopamine</u>, increasing alertness.

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Iron is also necessary for making dopamine. One small study⁶ showed ferritin levels (a measure of iron stores) to be low in 84 percent of children with ADHD, compared to 18 percent of a control group. Low iron levels correlate with severe ADHD.

Zinc regulates the neurotransmitter dopamine, and may make methylphenidate more effective by improving the brain's response to dopamine². Low levels of this mineral correlate with <u>inattention</u>.

More of these nutrients is not necessarily better, and sometimes problematic. Studies⁸ using megavitamin therapy in children with ADHD showed no effect.

The Sugar Debate

Most parents of children with ADHD — 84 percent of 302 parents in one 2003 study¹¹ — believe that sugar has a negative effect on their kids' behavior. And many adults with ADHD are convinced that sugar worsens their symptoms as well.

But medical experts still tend to discount any link between behavior and sugar or artificial sweeteners. As evidence, they point to a pair of studies that appeared in the *New England Journal of Medicine*¹² ¹³. "Effects of Diets High in Sucrose or Aspartame on the Behavior and Cognitive Performance of Children" (February 3, 1994) found that "even when intake exceeds typical dietary levels, neither dietary sucrose nor aspartame affects children's behavior or cognitive function." A similar study, "The Effect of Sugar on Behavior or Cognition in Children" (November 22, 1995), reached much the same conclusion — though the possibility that sugar may have a mild effect on certain children "cannot be ruled out," according to the study's authors.

In any case, sugar carries loads of calories and has no real nutritional value. People who eat lots of sweets may be missing out on essential nutrients that might keep them calm and focused. Since ADHD medications tend to blunt the appetite, it's important to make every calorie count.

The most recent review¹⁴ of all the studies on diet and ADHD, concluded and published in 2014, found mixed outcomes, which proves the science is still shaky in this area. They found that parents often reported behavior changes with artificial food colorants and additives, but teachers and clinical tests didn't report the same level of change. They could conclude that artificial colors do react adversely with ADHD symptoms in some children.

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The studies on sugar and artificial colors had negligible results as well, thwarting the theory that sugar and artificial sweeteners cause ADHD symptoms. And all studies on the effect of elimination diets on ADHD symptoms that they looked at found statistically significant ADHD symptom reduction when the children were given a narrow diet of foods unlikely to cause reactions.

¹ MD, Eva Selhub. "Nutritional Psychiatry: Your Brain on Food." *Harvard Health Blog*. Harvard Health Publications, 17 Nov. 2015.

² Bouchard, M. F., D. C. Bellinger, R. O. Wright, and M. G. Weisskopf. "Attention-Deficit/Hyperactivity Disorder and Urinary Metabolites of Organophosphate Pesticides." *Pediatrics*, vol. 125, no. 6, 2010.

³ Amber L. Howard, Monique Robinson, Grant J. Smith, Gina L. Ambrosini, Jan P. Piek, and Wendy H. Oddy. "ADHD Is Associated With a 'Western' Dietary Pattern in Adolescents." *Journal of Attention Disorders*, 2010; DOI: 10.1177/1087054710365990

⁴ Wurtman, Richard J. "Nutrients That Modify Brain Function." *Scientific American*, vol. 246, no. 4, 1982, pp. 50–59., doi:10.1038/scientificamerican0482-50.

⁵ Schoenthaler, Stephen J., et al. "The Effect of Vitamin-Mineral Supplementation on the Intelligence of American Schoolchildren: A Randomized, Double-Blind Placebo-Controlled Trial." *The Journal of Alternative and Complementary Medicine*, vol. 6, no. 1, 2000, pp. 19–29., doi:10.1089/acm.2000.6.19.

⁶ Konofal, Eric, Michel Lecendreux, Isabelle Arnulf, and Marie-Christine Mouren. "Iron Deficiency in Children With Attention-Deficit/Hyperactivity Disorder." *Archives of Pediatrics & Adolescent Medicine*, vol. 158, no. 12, 2004, pp. 1113.

⁷ Akhondzadeh, Shahin. "Zinc Sulfate as an Adjunct to Methylphenidate for the Treatment of Attention Deficit Hyperactivity Disorder in Children: A Double Blind and Randomized Trial." *BMC Psychiatry*, vol. 4, no. 9, 2004, doi:10.1186/isrctn64132371.

⁸ Haslam, Robert, et al. "Effects of Megavitamin Therapy on Children with Attention Deficit Disorders." *Pediatrics*, vol. 74, no. 1, July 1984, pp. 103–111.

⁹ Pelsser, Lidy M. J., et al. "A Randomised Controlled Trial Into the Effects of Food on ADHD." *European Child & Adolescent Psychiatry*, vol. 18, no. 1, 2008, pp. 12–19., doi:10.1007/s00787-008-0695-7.

¹⁰ Schab, David W., and Nhi-Ha T. Trinh. "Do Artificial Food Colors Promote Hyperactivity in Children with Hyperactive Syndromes? A Meta-Analysis of Double-Blind Placebo-Controlled Trials." *Journal of Developmental & Behavioral Pediatrics*, vol. 25, no. 6, 2004, pp. 423-34.

¹¹ Dosreis, Susan, et al. "Parental Perceptions and Satisfaction with Stimulant Medication for Attention-Deficit Hyperactivity Disorder." Journal of Developmental & Behavioral Pediatrics, vol. 24, no. 3, 2003, pp. 155–162., doi:10.1097/00004703-200306000-00004.

¹² Wolraich, Mark L., et al. "Effects of Diets High in Sucrose or Aspartame on The Behavior and Cognitive Performance of Children." *New England Journal of Medicine*, vol. 330, no. 5, Mar. 1994, pp. 301–307., doi:10.1056/nejm199402033300501.

¹³ Wolraich, M L, et al. "The Effect of Sugar on Behavior or Cognition in Children." *JAMA*, vol. 274, no. 20, Nov. 1995, pp. 1617–1621.

¹⁴ Nigg, Joel T., and Kathleen Holton. "Restriction and Elimination Diets in ADHD Treatment." *Child and Adolescent Psychiatric Clinics of North America*, vol. 23, no. 4, 2014, pp. 937–953., doi:10.1016/j.chc.2014.05.010.

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