

## 8. Omega-3 deficiencies

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**Introduction.** Over 2,000 scientific studies have demonstrated the wide range of problems associated with Omega-3 deficiencies. The American diet is almost devoid of Omega 3's, except for certain types of fish. In fact, researchers believe that about 60% of Americans are deficient in Omega-3 fatty acids, and about 20% have so little that test methods cannot even detect any in their blood.

The human brain is more than 60% structural fat, just as your muscles are made of protein and your bones are made of calcium. But it's not just any fat that our brains are made of. It has to be certain types of fats, and we no longer eat these types of fats like we used to. Worse, we eat man-made trans-fats and excessive amounts of saturated fats and vegetable oils high in Omega-6 fatty acids, all of which interfere with our body's attempt to utilize.

Other parts of our bodies also need Omega-3 fatty acids. Symptoms of fatty acid deficiency include a variety of skin problems such as eczema, thick patches of skin, and cracked heels. Imagine your brain conducting some routine maintenance on your dopamine and serotonin receptors (implicated in both ADD and mood disorders). These receptors are composed of an Omega-3 fatty acid called DHA. If you don't have much DHA in your blood, man-made trans-fat molecules may be used as a construction material instead. But trans-fats (hydrogenated oils) are shaped differently than DHA: they are straight while DHA is curved.

The dopamine receptor becomes deformed and doesn't work very well. Repeat this scenario day after day, year after year, and you could wind up with problems like depression and problems concentrating. This problem is most severe for a child whose brain is still developing.

A lack of highly unsaturated fats is particularly noticeable in connection with brain and nerve functioning. An adjustment in diet to one with oil and protein contents high in unsaturated fats brings the best results in children. Now imagine a child in school learning math. The act of learning requires the brain to form new neural pathways. DHA is needed, especially for the delicate neural synapses which are composed entirely of DHA. This child, like the vast majority of U.S. children, eats almost no Omega-3 fatty acids. What does the brain do?

Again, it struggles and finally uses other types of fats, which are the wrong shape. The neural network develops slowly and is defective. The child has learning and memory problems as well as behavior problems. In a study of learning ability, rats were raised on either a diet that was deficient in Omega-3 fatty acids or one that was nutritionally complete. Initially, both groups of rats had similar numbers of synaptic vesicles.

After a month-long learning program, however, the Omega-3 enriched rats had considerably more vesicles in their nerve endings and also performed markedly better on the tests. This study suggests there may be a direct connection between the amount Omega-3 fatty acids in your diet, the number of synaptic vesicles in your neurons, and your ability to learn."

Within the next 5 or 10 years the population at large will become familiar with the issue of fatty acid deficiency and the harm caused by trans fats, and there will be significant changes in the way food is formulated and marketed. In response to growing public pressure and the rising number of studies implicating trans fats, the FDA has announced a new rule that will require the trans fat content of foods, but it won't become effective for a few years. Companies are beginning to market omega-3 foods, like tuna and eggs from chickens fed with high-omega 3 foods.

Research has shown that the diets of hunter/gatherers were rich in Omega-3's. They ate a mix of meat, fruits and vegetables, with little or no grains. Green leafy vegetables, certain seeds and nuts, and wild game are rich in Omega-3's.

It turns out that cows, chickens and other animals have much higher levels of Omega-3s when they are fed by "free-range" methods because they eat lots of green leafy vegetables. On the other hand, if they are fed grain, their Omega-3 levels crash. Wild game is much healthier to eat and it is much leaner than farm-raised animals.