BRAIN HEALTH FOR LIFE

Beyond Pills, Politics, and Popular Diets

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Why Your Brain Needs Good Food

Your brain needs nutritious food to maintain its 100 billion nerve cells and 200 billion supporting cells. It's composed of protein and fat and fueled by carbohydrates.

Although the brain weighs only three pounds, it takes a disproportionate amount of fuel and energy to function. When you eat a meal, the food is converted to brain cells through digestion. During the digestive process, proteins become amino acids, fats become fatty acids, and carbohydrates become glucose and glycogen. Amino acids provide structure for cells and produce hormones. Fatty acids are used for insulation, to make cholesterol, and for fuel if there is a shortage of glucose. Glucose and glycogen are sources of fuel. The brain has one of the richest networks of blood vessels in the body. Your brain uses 25% of the oxygen you breathe. It is also highly susceptible to toxins and inflammation. The brain is both dynamic and delicate.

The Inner Workings of the Brain

The brain is one of the most complicated and miraculous things on Earth. It's the master computer of the body, directing the mind and managing the body. It does so by sending electrochemical messages from one neuron

to another, creating a network that directs thoughts, actions, feelings, and bodily functions. As the trillions of nerve cells communicate and interact, we are able to experience ourselves as conscious human beings.

CHAPTER 7

Redeeming Fat

Fat, particularly saturated fat, has had a bad rap for decades. But no matter what the "experts" say, it's essential for good health. In addition to being critical for our brains, which are 60% fat, fat is the main fuel for our muscles, including the heart. Fat is necessary for healthy liver and gall bladder function and for the absorption of fat-soluble vitamins. It is required for the digestion of proteins. Stored fat enhances the function of the immune system and helps fight infection. Fat cells produce hormones and other compounds that affect metabolism, weight, and overall health. Fat gives food flavor and makes it satisfying and tasty. If we have enough fat in our diets, it reduces our craving for less healthy foods.

The Myth of Fat and Heart Disease

In spite of all these vital functions, fat has had a bad reputation, particularly as a contributing factor to heart disease. Although there is little scientific proof that a connection exists between fat consumption and heart disease, the USDA suggests that fat intake be limited. Both the USDA's 2011 *MyPlate* and 1992 *Food Guide Pyramid* recommend limiting solid fats such as butter, milk fat, cream, beef fat, pork fat, chicken fat, and coconut and palm oils, the very fats that have been shown to promote brain health. To further discourage

consumers from eating saturated fats, the supplemental information for *MyPlate* lists many of the same fats, along with sugar, as "empty calories."

CHAPTER 13

Exercise to Build a Better Brain

"Birdbrain!" is an expression for someone who is forgetful or acts foolishly. Because a bird's brain is so small, we underestimate its capacity. Don't be fooled by size. A lowly chickadee may find and hide thousands of seeds for the winter and remember exactly where each is hidden. To accomplish this herculean feat, the bird's brain expands 30% during the fall food storage season. In the spring, when it no longer needs this ability, its brain shrinks. So it is with us humans. If we use our brains, they grow. If we don't, they shrink. The key to our brain size is use and exercise.

People who exercise have bigger brains. Aerobic fitness, or any activity that uses the large muscles of the body long enough to raise the heart rate, is positively related to a larger hippocampus, the part of the brain that is responsible for thinking, and creating and storing memories. Conversely, people with Alzheimer's and other serious forms of dementia tend to have smaller than normal hippocampi.

As I've discussed, it was formerly believed we were born with a certain number of brain cells and that was it for life. Current research tells us this is not true. We now know a process called neurogenesis creates new cells. One of the mechanisms for creating new neurons is exercise. Exercise stimulates the creation of new brain cells and

staves off the effects of what we call aging. It reduces memory loss and dementia, and increases physical and mental capacity. Exercise helps prolong life and keep chronic illness at bay.