

I'll Have the Alzheimer's On Whole Wheat, Please

Peyton Schrag

Department of Biology
Lake Forest College
Lake Forest, Illinois 60045

Ordering a sandwich from Subway is not an easy task. You have to decide if you want Italian or multigrain bread, ham and turkey or roast beef, mayo or chipotle sauce, toasted or cold. With so many choices, your brain has a lot to sort through. What you probably aren't considering, however, is how this critical choice impacts the health of your brain. Currently, evidence is mounting for the case against a carbohydrate-rich diet, specifically one filled with grains. This idea may contradict the "experts", like the FDA or American Heart Association, who encourage "healthy" whole grains in your diet. But scientists are continually collecting data, demonstrating how the elimination of all grains from the diet can help improve health in a variety of ways. Not only does this evidence have implications for the body, but it also has important implications for the brain.

One of the main culprits of a carbohydrate-rich diet is gluten. Gluten is a protein found in most grains that catalyzes celiac disease and other gluten-related sensitivities, affecting an estimated 20 million people in the United States alone (Sapone, et al.). It does its dirty work by sticking to your intestines and breaking down the walls of the intestinal tract (Davis, 2011). Along with its partner, lectin, gluten initiates an autoimmune response because the immune system recognizes these molecules as foreign invaders (Mama, 2011). This has a pair of consequences. One, your intestinal walls become severely impaired, sometimes to the extent of leaky gut syndrome; literally a hole in your intestine (Fasano, 2012). Two, this inflammation initiates the release of cytokines, which not only causes damage to foreign cells, but also to your own cells (Perlmutter, 2013). The brain is highly threatened by cytokines, as they damage cells and leave the brain susceptible to disease (Perlmutter, 2013). This explains why they are found in high levels in neurological diseases, such as Parkinson's disease, Alzheimer's disease, and epilepsy (Farooqui et al, 2007). Strong positive correlations between gluten sensitivity and dementia have also been observed, indicating that inflammation from grains contributes to memory loss as well (Davis, 2011).

The second offender is insulin-resistance. That's right, the mechanism known to cause diabetes is strikingly similar to the process that occurs in the brain after long periods of grain consumption. So similar, in fact, that Alzheimer's was originally named type 3 diabetes (Suzanne & Wands, 2008). So how exactly does this process work? After eating a bag of donut holes, the carbohydrates are quickly digested into simple sugars and released into the blood stream. Insulin is then recruited in high amounts in response to this overload of available energy and directs your cells to store some of the sugar for later use (Davis, 2011). When carbohydrates are consumed regularly, the amount of insulin needed to store the sugar increases, similar to the way someone develops a tolerance to a drug (Perlmutter, 2013). Over time, the body's cells do not respond to insulin properly and brain symptomology similar to type 2 diabetes develops (Suzanne & Wands, 2008). However, this is not the only problem. The high levels of insulin floating around are hazardous to the

brain because they encourage the formation of oligomers, like those seen in neurodegenerative diseases, while also initiating an inflammatory response (Perlmutter, 2013). As we have seen before, inflammation can be a dangerous thing for the brain.

A better way of fueling the brain is to break down fats to use as energy. Fats are a long term source of energy, so it takes longer to extract the energy stored within them. However, fats provide more than twice as much energy, per gram, than carbohydrates do. This makes fats the preferred energy source of the brain, especially when inflammation and insulin-resistance are not involved. Mistakenly seen as contributors to disease in many cases, fats actually have many important roles in the brain, such as absorbing necessary fat-soluble vitamins and controlling almost all of your hormone levels (Perlmutter, 2013). Along with cholesterol, fats regulate the function of neurons and even protect the brain from many types of neurodegenerative diseases (Perlmutter, 2013). So don't be afraid swapping your morning cereal with an avocado and egg.

Overall, grains may seem like an essential part of everyday life and a staple of every meal. But when the necessity of a grain-rich diet is compared to the risk factors that are associated with it, you can see that they may do more harm than good. Gluten, cytokines, insulin resistance, and other causes of brain inflammation provide evidence that a grain-free diet is a much safer road to take and may even prevent these threats from damaging your brain health. A switch from carbohydrates to fats, as your main energy source, can leave you with higher energy levels throughout the day and clearer mental functioning. Maybe you'll feel how much better your brain is working when you step up to the Subway counter and know exactly what to order. Or maybe it's because your only choice is the salad.

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