



# The Role of MICRONUTRIENTS in CELIAC DISEASE

## WHAT IS CELIAC DISEASE?

Celiac disease is characterized by the inability to tolerate gluten, which is a protein found in wheat, rye and barley. When gluten is ingested by a person with celiac disease, an allergic reaction follows that causes serious damage to the intestinal wall, ultimately creating malabsorption issues and a host of cascading health problems. Some estimate that celiac disease is prevalent in over 2% of the general population.

## ITAKE A MULTI-VITAMIN AND EAT A GLUTEN FREE DIET. ISN'T THAT ENOUGH?

The simple answer is no. Just as every person is different, the "normal" amount of each micronutrient varies from person to person, and even in the same person depending on circumstances in his or her life. We are all biochemically unique, and several factors affect personal micronutrient needs – age, lifestyle, metabolism, prescription drug usage, past and present illnesses, absorption rate, genetics and more.

Especially in the case of celiac disease, whether diagnosed or undiagnosed, comprehensive nutritional testing is extremely important. Celiac patients are notoriously at higher risk for nutrient deficiencies, largely due to malabsorption issues. But when it comes to supplements, the "more is better" philosophy does not apply. Balance is key. SpectraCell's micronutrient testing is the answer:

SpectraCell's micronutrient tests measure 33 vitamins and minerals in your body. The SpectraCell test goes even further – it measures the functional, long-term levels within the cell, which means it evaluates how well your body actually utilizes each nutrient. Your body may need more of a nutrient than someone else, or perhaps your body lacks the coenzymes needed to transport it, or perhaps it is not absorbed properly after ingestion. That is why an individual assessment of your nutritional status is so important.

True healing begins with your body's foundation – micronutrients – the vitamins, minerals and antioxidants your body needs to function optimally every day and over a lifetime.

## PREDISPOSITION TO NUTRITIONAL DEFICIENCIES

Researchers followed a group of celiac patients who were on a gluten-free diet for 10 years and they found that half of the adult celiac patients showed signs of poor vitamin status. Since production of digestive enzymes is generally less efficient in celiac patients, absorption of nutrients from food is compromised.

## ANTIOXIDANT STATUS OF CELIAC PATIENTS

Intestinal inflammation, so commonly seen in celiac patients, creates oxidative stress. As a result, the antioxidant status of celiac patients is significantly reduced, mostly by a depletion of glutathione, considered by many the most potent antioxidant in our bodies. In addition, levels of other antioxidants such as cysteine and vitamin C will affect glutathione status. You can see how measuring a single nutrient only gives a small piece of the metabolic puzzle.

Fortunately, SpectraCell's micronutrient testing also gives your Spectrox™ score, which is a measurement of your Total Antioxidant Function. In short, it measures how well your cells stand up to oxidative stress. SpectraCell's micronutrient testing also measures the function of several powerful antioxidants such as lipoic acid, coenzyme Q10 and vitamin E. Even a single deficiency can negatively affect your Spectrox™ score. Since oxidative stress is an important factor in the pathogenesis of celiac disease, knowing and raising your Spectrox™ score is important.

## A SPECIAL ROLE FOR GLUTAMINE

One hallmark of celiac patients is that they tend to have damage in the lining of their small intestine. This damage increases the permeability of the walls of their digestive tract, allowing normally benign substances into the bloodstream, where they are no longer treated as harmless. An allergenic, or autoimmune, response follows wreaking havoc throughout the body. Glutamine is an amino acid that is particularly effective in mitigating this dangerous cascade of events starting in the gut. Deprivation of glutamine results in increased intestinal permeability since glutamine helps to form tight junctions between cells of the delicate intestinal wall.

## NEUROLOGICAL PROBLEMS STEM FROM NUTRIENT DEFICIENCIES

Researchers estimate that 11-41% of celiac patients have vitamin B12 deficiency, which impairs function of the nervous system. In fact, resolution of vitamin B12 deficiency will in many cases resolve neurological problems associated with celiac disease. Similarly, a deficiency in copper will often manifest as neurological problems or anemia in celiac patients. In fact, some researchers suggest that celiac disease should be considered in patients with copper deficiency, even if there are no gastrointestinal problems.

## FOLATE DEFICIENCY

Celiac patients are at higher risk of B vitamin deficiencies, specifically folate. There are several reasons for this. First, the primary transporter of folate into our bloodstream is found on the tips of the finger-like projections in the intestinal wall called villi. Since intestinal damage (called atrophy) is so common in celiac patients, the process of absorption of nutrients, and especially folate is severely impaired. Second, the pH of the stomach affects folic acid absorption. The higher the pH, the lower the absorption of folic acid, which is the case in celiac patients. Third, many medications used in inflammatory conditions of the gastrointestinal tract are known to be folate depleting.

## BONE BUILDING NUTRIENTS FOR CELIAC PATIENTS

Compromised bone health is often an unfortunate consequence of celiac disease largely because a much higher percentage of children with celiac are deficient in magnesium, calcium and vitamin D compared to children without celiac. These nutrients work together in many ways. For example, when there is sufficient vitamin D, 30-40% of intestinal calcium can be absorbed but in the presence of vitamin D deficiency, only 15% of calcium is absorbed, leading to poor bone health among other things. It is easy to see how correcting even a single nutrient deficiency can indirectly help the status of another.

## DEPLETION OF MINERALS

The impact of mineral deficiencies is extremely broad. For example, zinc deficiency compromises the immune system and is implicated in many skin disorders, which often accompany celiac disease. In a recent study on children with celiac disease, it was found that zinc levels were up to 30% lower in children with untreated celiac, and that over 50% of patients with celiac have low zinc levels. Selenium deficiency is also common in celiac patients. Since thyroid is particularly sensitive to selenium, a deficiency in this mineral, which also serves as a powerful antioxidant, can contribute to thyroid dysfunction.

## FATIGUE IN CELIAC

Fatigue is a very common symptom of celiac disease. Although several nutrients contribute to energy production (such as B vitamins and chromium), the relatively unknown amino acid carnitine is intimately involved in energy production and particularly effective in reducing fatigue. Interestingly, levels of carnitine are lower in celiac patients. In fact, one study showed that fatigue was significantly reduced in a group of celiac patients when they were supplemented for six months with carnitine.

## A MULTI-FACETED APPROACH

Since so many nutrients are needed to keep our complex digestive, immune and other systems functioning properly, a comprehensive assessment of your nutritional status is key, especially in disorders like celiac disease where the risk of deficiency is particularly high. The potential improvement of symptoms when even a single deficiency is corrected can often be quite dramatic.

Micronutrient  
Testing 

**SpectraCell's micronutrient tests measure 33 vitamins, minerals and antioxidants in your body and evaluates how well your body absorbs and utilizes each nutrient. Ask your doctor about SpectraCell's Micronutrient Testing today!**