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Finland, Dietary Diseases

**Finland: Advocating For an Internal Solution**

In the last two decades there has been a significant increase in the number of people opting to change their dietary intake to exclude gluten, a protein naturally found in certain cereal grains, to lose weight or address skin acne. There are a number of people who are required to be gluten-free for medical reasons such as those with celiac disease, where gluten irritates and damages the small intestine leading to adverse health conditions. There are many other people in the world that have celiac disease, but are oblivious due to the lack of symptoms that would lead to disease identification. While celiac disease is prevalent across the world, the country of Finland has a population that is becoming more aware of the disease through dietary and medical diagnosis. Currently, there is not a cure for celiac disease but small short-term solutions. A large amount of the world's population does not even know they have celiac disease and that is causing unknown malnutrition along with other health concerns. This has become more prevalent in the world, especially in Finland.

Finland is located in Northern Europe surrounded by ocean with the majority of the land being forests. A typical family is between two to three people that live in semi-detached houses, attached houses or wood cabins (“Your Guide For Living in Finland”). The youth are required to go through secondary school, which the Government pays for, and then some continue to post-secondary school before entering the workforce (“Your Guide For Living in Finland). The most popular jobs in Finland are wood working, mental health careers, and health care, with an average wage of 3,800 Euros (“Your Guide For Living in Finland). Healthcare is free in Finland for children and pregnant women (“Your Guide For Living in Finland). On a normal day, the Finnish eat a warm breakfast with coffee, and enjoy a cold lunch with certain meal requirements for children at school. For dinner, the Finns enjoy fish and meat alongside bread (“Finland: Exploring the Culture”). Gluten, therefore, is present in every meal, every day.

Gluten is defined as a type of protein. Gluten is found in wheat, barley, rye, and malt, but their byproducts could also contain gluten (“What is Celiac Disease?”). Celiac disease, where gluten causes significant health and malnutrition issues, is an autoimmune disorder that affects one out of 100 people with the Human Leukocyte Antigens (HLA) gene (Accomando). An increased presence of the HLA gene is detrimental. The National Institute of Health states the following on HLA genes, “They play a significant role in disease and immune defense. They are beneficial to the immune system but can also have detrimental effects”. A person with celiac disease has an increased amount of the HLA gene, making the body overreact to the proteins in gluten. When a person with celiac disease consumes gluten, the immune system attacks and damages the small intestine pili, the finger-like parts within the small intestine. The long-term damage to the intestine makes it impossible to absorb nutrients and results in malnutrition ("What is Celiac Disease?").

Celiac disease is hereditary, meaning it is passed from parent to child. There is a one in 10 chance of passing the HLA gene ("What is Celiac Disease?"). Gluten contains iron, magnesium, and B12 which is critical for humans to function (“Gluten-Free Diet”). The human body needs each of these nutrients to function and avoid triggering serious or deadly consequences. It is estimated that about 60-70% of people with celiac disease are oblivious to having the disease and are constantly depriving their bodies of these critical nutrients (“20 Things You Might Not Know”). This is leading to significant malnutrition issues not only in Finland, but across the world.

The effects of having celiac disease or going undiagnosed are dramatic and can affect all ages. One of the worst effects of celiac disease is pili atrophy and stroke. Pili atrophy is when the pili in the small intestine that normally absorb nutrients fail to function and ultimately die. the nutrients atrophy, parts of the body get worn down causing the cells to die off and in the end die. The pili are damaged through the body's increased immune response to gluten protein. Without pili to absorb nutrients, there has to be an alternate route of capturing the nutrients that bypasses the small intestine (“What is Celiac Disease?”). Failure to absorb the proper nutrients would ultimately require intravenous injection of nutrients directly into the bloodstream to prevent malnutrition. In extreme cases, ischemic stroke, a deficiency in B12 that causes irreversible damage between the brain and the rest of the body, can occur and are unfortunately more common with celiac disease (Zhou). The changes between the brain and the body are found in the myelin sheath, which increases the speed of transmissions in the body but for someone with malnutrition it can result in slower transmissions. A diet without the proteins found in gluten causes changes in the molecular composition of the body, according to Li Zhou of the National Natural Science Foundation of China the “Gut microbial composition and gut-brain immune [homeostasis](https://www.sciencedirect.com/topics/medicine-and-dentistry/homeostasis) and toxic stress responses to the brain.” If the human body is not able to get enough nutrients, it can result in increased stress in the brain and slower connections between the brain and the body, which could lead to a stroke or death.

Understanding the background and impacts of celiac disease, Finland leads the world in the number of people with celiac disease as well as individuals who have not been tested. About 2% of Finland's population has celiac disease (“Celiac Disease: Fast Facts”). This number is twice as much as the United States or Italy, for example. Studies on the number of people with celiac disease have been increasing according to S. Lohi who is a part of the *Alimentary Pharmacology & Therapeutics,* who stated, “The total prevalence of celiac disease seems to have doubled in Finland during the last two decades, and the increase cannot be attributed to the better detection rate”. This leads to the hypothesis that people are becoming more and more intolerant of gluten in Finland. There is also the issue of people never getting diagnosed. Only 30% are diagnosed correctly (“What is Celiac Disease?”). A majority of those who have an increased HLA gene have not visited a doctor to get tested for celiac disease. In Finland healthcare is free for children and pregnant women. Celiac disease is not tested at birth or any precautions taken like other evolving countries. This evidence provides a strong basis for Finland, and other parts of the world for that matter, to increase celiac testing and ongoing care to prevent malnutrition and better protect their citizens.

The Finns enjoy bread with every meal no matter the time of day. Additionally, Finland has a disproportionate level of population with celiac disease and it continues to increase with each generation. Europeans naturally have increased HLA genes which adds to the climbing number of Finland's population that have celiac disease (“Celiac Disease: Fast Facts”). It is very common to have a nutrition deficiency. “Malabsorption of many nutrients, including iron, vitamin D, and zinc, are common in a person with newly diagnosed or untreated celiac disease” (Beth Israel). Many of those nutrients are found in the gluten protein that someone with celiac disease cannot absorb. Celiac disease undiagnosed or untreated leads to higher malnutrition rates and health problems.

More and more gluten-free diets are trending for those who want to lose weight. The belief that a gluten-free diet is healthier can lead more people to adopt the trend, but it can cause hormonal imbalances as well as weight increase, loss of hair, and changes in brain chemicals (“Gluten-Free Diet”). Starting a gluten-free diet creates gluten withdrawal, which can cause mood swings, hormonal imbalance, weight gain, and dizziness as well as chemical changes in the brian resulting in anxiety and depression (“Gluten-Free Diet”). People with celiac disease face gluten withdrawal on “steroids'' immediately, having to cut out gluten and attempting to rebalance the nutrients in their body. For instance, a gluten-free diet increases cholesterol as whole grains lower it, so managing celiac disease with a doctor is critical (''Gluten-Free Diet”). A person with celiac disease can get into a vicious cycle where the residual effects of the disease causes more consumption of gluten to recover, yet this behavior further damages the small intestine. These impacts further highlight that people get tested and carefully manage the effects of celiac disease on their bodies.

Cutting out gluten is a major change in lifestyle. Most grocery stores in Finland carry gluten-free products. The biggest issue with transitioning to a gluten-free lifestyle in Finland is the lack of free healthcare, that would increase the chance of early diagnosis and critical treatment post diagnosis. Visiting a doctor adds extra benefits to those with celiac disease. They can provide a heavy dose of foods with probiotics to help absorption (Gerszberg). Small intestine needs help recovering from eating gluten, which can be done with the help of antibiotics and monitoring from healthcare professionals (Gerszberg). Having continual contact with healthcare professionals is critical in Finland where this disease is prevalent as well as hidden.

While there is not a cure for celiac disease, the best way to avoid complications with celiac disease is early identification, proper care and adjustment of dietary intake. But what if there was a better way, so that those who are not properly or undiagnosed will not have as many health complications? Adding B12, zinc, magnesium, vitamin A, and calcium into gluten-free items will not only prevent serious conditions but also provide necessary nutrients that humans need to survive. It will add that extra benefit of the vitamins that are lacking in a gluten-free diet. This approach also removes the unknown danger of going on a gluten-free diet. Similarly, the benefits of a gluten-free diet could also be contemplated for products containing gluten to improve the health, to the extent possible, of those with undiagnosed celiac disease. The benefits outweigh the cons on this idea. People with celiac disease can lose hair and appetite, gain weight, have mood swings and have long lasting effects that can be life changing (“Gluten-Free Diet”). Another solution to celiac disease could be as easy as adding a couple of nutrients to gluten-free products to improve overall nutrition. This could be implemented in Finland with an abundance of fish due to the geography; many of the nutrients missing in a gluten free diet are found in fish.

A long term solution could be on the horizon. Adding necessary nutrients that are typically found in fortified wheat. An easy way for those nutrients to be added into gluten-free food items is fish. Finland is abundant with fish due to the natural geography, catching around 153,000 Tons per year (“Finland - Fishery and Aquaculture”). As their main income fish are at the center point of life in Finland. Finland has about 1 in 1000 having a full or part time job in aquaculture (“Finland - Fishery and Aquaculture”). Fish have an abundance of vitamin B12 and zinc as well as calcium (“Health Benefits of Fish”). Even without an abundant supply of all of the supplements that would be needed to be purchased, people can purchase a fish for around 9.9 Euros (“Food & Drink Prices”). Looking from the outside, this is a very minimal cost compared to all the medical attention that would be needed if the nutrients aren't present and the malnutrition that would follow. This would prevent dozens of malnutrition cases as well as other health conditions associated with certain nutrient deficiency regardless of having celiac disease or not.

To conclude, while some people move to gluten-free diets for non-medical reasons, there is a significant and growing problem with the early diagnosis and treatment of people in the world and especially in Finland. If left unaddressed, malnutrition will grow leading to shorter lifespans and a lower quality of life. This situation can be addressed by early diagnosis, medical treatment and better dietary options. New options include adding nutrients into gluten-free food options, and similarly nutrients into non-gluten-free foods to improve health outcomes for those celiacs who go undiagnosed. While Finland leads the way, this is a worldwide issue.

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