



NUTRIGENOMI ®
EAT ACCORDING TO YOUR GENES

NGx-Gluten™ Personalized Nutrition Report





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Introduction

Hello Caroline:

Nutrigenomix is pleased to provide you with your NGx-Gluten™ Personalized Nutrition Report based on your genetic profile. NGx-Gluten™ is the most comprehensive genetic test for gluten intolerance and examines six variations in the HLA genes to determine whether you have low, medium or high risk.

Our laboratory has used state-of-the-art genetic testing procedures to analyze the DNA from the saliva sample you provided. Identifying your unique genetic profile will help determine whether a gluten-free diet might be right for you. Your results will help you eat according to your genes!

A handwritten signature in black ink, appearing to read "Ahmed El-Sohemy".

Ahmed El-Sohemy, PhD
Chief Science Officer



Gluten Intolerance

Gluten is a protein found in wheat, barley, rye and products made from these grains. Many foods that contain gluten provide fibre from whole grains and can be an excellent source of vitamins and minerals. However, for some people, gluten can cause severe digestive problems leading to nutrient malabsorption, anemia and many serious health problems.

Celiac disease represents the most severe form of gluten intolerance and affects about 1% of the population. For people with celiac disease, gluten ultimately damages the villi lining the small intestine. It is these villi, or hair-like structures, that are responsible for absorbing nutrients from the food we eat. When these villi become inflamed and flattened, individuals become unable to absorb nutrients effectively, which leads to further symptoms including fatigue, joint pain, skin rashes and conditions such as iron deficiency, anemia and osteoporosis. People with celiac disease require a gluten-free diet for life.*

Non-celiac gluten sensitivity (NCGS) is a milder form of gluten intolerance that may affect 5% of the population. Unlike celiac disease, NCGS does not result in damage to the small intestine or interfere with the absorption of nutrients. Individuals with NCGS often experience diarrhea, abdominal pain, fatigue and headaches when they consume gluten-containing foods. However, these adverse effects of gluten in individuals who do not have celiac disease are poorly understood and NCGS remains controversial.*

* Tonutti E and Bizzaro N. Diagnosis and classification of celiac disease and gluten sensitivity. *Autoimmunity Reviews*. 2014;13:472-6.

HLA Genes

The HLA genes produce a group of proteins called the human leukocyte antigen (HLA) complex, which are responsible for how the immune system distinguishes between the body's own proteins and foreign, potentially harmful proteins. Research has shown that the HLA genes are the most important genetic predictor of gluten intolerance. Approximately 99% of people with celiac disease¹ and 60% of those with non-celiac gluten sensitivity² have the DQ2 or DQ8 risk version of HLA, compared to only 30% of the general population.

Six variations in the HLA genes can be used to classify individuals into predefined risk groups for gluten intolerance.³ Risk prediction is based upon a scale of low, medium or high risk.

- 1 Mark Wolters VM and Wijmenga C. Genetic background of celiac disease and its clinical implications. *American Journal of Gastroenterology*. 2008;103:190-5.
- 2 Sapone A et al. Divergence of gut permeability and mucosal immune gene expression in two gluten-associated conditions: celiac disease and gluten sensitivity. *BMC Medicine*. 2011;9:23.
- 3 Monsuur AJ et al. Effective detection of human leukocyte antigen risk alleles in celiac disease using tag single nucleotide polymorphisms. *PLoS ONE*. 2008;3:e2270.

Low Risk

70% of the population

Medium Risk

20% of the population

High Risk

10% of the population



Your Results

Gene	Marker	Your variant
HLA	rs2395182	TT
	rs7775228	TT
	rs2187668	CT
	rs4639334	GG
	rs7454108	TT
	rs4713586	AA

Your Risk

Medium

Recommendation

Since you possess this specific combination of variants in HLA, you possess at least one copy of the DQ2 or DQ8 risk genotype. This does not mean you have celiac disease. Speak to your dietitian if you experience diarrhea, steatorrhea, cramps, flatulence, fatigue or joint pain while consuming gluten-containing foods, or if you have a family member with celiac disease. Major dietary sources of gluten include bread, pasta, cereal and any baked good made with wheat, barley or rye. It is not recommended that you immediately attempt to remove gluten from your diet, as eliminating gluten may interfere with the accuracy of celiac disease diagnostic tests.

Following a Gluten-Free Diet

Gluten-free foods include all unprocessed vegetables, fruit, dairy products, meat, fish, poultry, nuts, legumes, seeds, fats and oils.

Gluten-free grains include: rice, quinoa, corn, buckwheat, amaranth and millet.

Foods to avoid include any of the following products that are made with wheat, rye, barley or triticale.

Major Sources of Gluten	Hidden Sources of Gluten
Bread	Salad Dressing
Pasta	Pudding
Cereal	Imitation Crab
Crackers	Vegan meat substitute
Oats*	Potato Chips
Baked Goods	Ketchup
Malt	Mustard
Soy Sauce	Chocolate
Gravy	Processed meat
Barley or Wheat Based-Beer	Canned Soup
Vinegars	Instant Rice
Wheat - including rye, spelt, and barley	Low-fat dairy products

* Pure oats do not contain gluten; however, oats are often cross-contaminated with gluten-containing grains.



This report is for information purposes only and is not intended to be used as medical advice. The advice in this report is not intended to treat, diagnose or cure any medical condition or disease. Clients with medical conditions should not change or stop their medications or medical care without consulting with their physician first. The advice in this report is not intended for children or for women who are pregnant or nursing. If you have any questions, please ask your Registered Dietitian or contact us at info@nutrigenomix.com. For Terms of Use and Privacy information please visit our website at www.nutrigenomix.com.

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