THE NUTRITION GENOME
REPORT PREVIEW
The Nutrition Genome Report looks at clinically relevant genes and is organized by the following order:

Your Final Results
Digestion
Methylation
Hormone Health
Neurotransmitters and Mental Health
Inflammation and Antioxidant Protection
Pharmacogenomics and Detoxification
DNA Damage, Protection, and Repair
Cardiovascular and Exercise Health
What to expect in your report...

The introduction of your report will explain how to read your genetic report, as well as a basic overview of your analysis.

The next section will give you an overall summary of your strengths and weaknesses, and how to strengthen the “chinks” in your armor.

You will be given the following based on your genetic results:

- Your highest vitamin, mineral and compound needs
- You will learn what foods, drinks, toxins and additives to minimize/avoid
- Recommended routine blood work markers

Finally, you will receive analyses of the processes mentioned previously, with the gene, the gene function, and your specific variants. The paragraphs are customized based on your unique genotype.

The following pages in this document will give you a look into what your report will include.
SAMPLE REPORT
PATIENT OVERVIEW

YOUR ANALYSIS

PATIENT NAME: Your Name
DATE OF ANALYSIS: Today’s Date
The Nutrition Genome Report is a book on you using genetic testing, nutrigenomics, and epigenomics. Genes are segments of DNA that tell your body how to function and what traits to express. The genome is the complete set of DNA. Nutrigenomics is the study of how diet affects your genes and how individual genetic differences can affect the way you respond to vitamins, minerals, and compounds in the foods we eat. Epigenetics and the epigenome are just like genetics and the genome. The only difference is the "epi" which essentially means "make a change upon." Epigenetics is how changes in your diet, environment, and stress levels affect specific gene activity and expression.

Your genes tell your ancestor’s health history and help explain your personal health history, but your future health history has yet to be written. Your DNA is fixed for life, but the epigenome can be altered based on the foods you eat, exercise, our environment, relationships and our lifestyle. It turns out, how we live can even influence the health of multiple future generations.

You will see letters next to your gene using the alleles (base pairs) A, C, G and T. Each gene is represented by two letters to determine a "genotype." You will read this in the table as Normal, Heterozygous or Homozygous. Normal variants will not come up in the tables for most of the tested genes, so it is important to look at the total number of genes tested in the gene function column to see relevancy for larger gene classes.

A heterozygous variant means you have 1 copy from your mother or father, while a homozygous variant means you have 2 copies, 1 from your mother and 1 from your father. The genotype that is the most clinically relevant is homozygous. There are exceptions when multiple genes in a class are heterozygous and have a cumulative effect on enzyme function.

It should be noted that there are many factors that can determine enzyme function, and therefore it is important to line up gene variants with symptoms, blood work, exercise and family history. This is why it is recommended that you share your report with your health care practitioner or schedule a consultation with Alex Swanson.
Epigenetics is at the heart of understanding how to strengthen our genome. The DNA remains fixed for life, but the epigenome remains flexible. These flexible signals come from our stress levels, diet, environment, relationships and sense of purpose. All of these determine the probability of certain hereditary susceptibilities being expressed, however, if we know where to focus, we can lower these probabilities.

People have approximately 22,000 genes in their genome. Everyone has the same set of genes, but each one can vary by a few letters (alleles) between people. Changes in these genes are referred to as "SNPs" or single nucleotide polymorphisms and gene variants. Differences in these gene variants determine our nutritional requirements and sensitivities.

SNPs have been inherited over many hundreds of thousands of generations due to the geography of our ancestors and epigenetic changes of our diet, environment, and lifestyle. These SNPs instruct enzyme function that require vitamins, minerals, amino acids, and compounds to do their job of keeping you healthy. Their function is affected by deficiency, toxicity, stress, drugs and toxins. Optimizing enzyme function may help lower inflammation, balance hormones, improve mental health, optimize digestion, increase athletic performance, and decrease the probability of disease. On the next page, you will see a summary of your strengths and weaknesses. This is generated from your entire genetic analysis based on your gene variants and will tell you where the most focus is required. Genes are not your destiny. They are your blueprint. Once you learn how to read the blueprint and make epigenetic improvements where there are weaknesses in the design, the foundation becomes healthier and more resilient.
STRENGTHS
- Reduced likelihood of saturated fats causing weight gain due to normal variant in APOA2 gene
- Good histamine breakdown in the digestive tract for APB1
- Good histamine breakdown in the skin, bronchial tissue and central nervous system due to a normal variant in HMNT
- Good conversion of beta carotene to vitamin A
- Normal MTHFR C677T gene function
- Improved breakdown of synthetic folic acid
- Good CBS function in the transsulfuration pathway
- Improved breakdown of dopamine, adrenaline and estrogen in response to stress for for COMT genes
- Good catalase gene function for oxidative stress
- Good glutathione antioxidant protection in the lungs for GSTM1
- Good NOS1 gene function for psychological stress
- Good COQ2 gene function for a lower likelihood of statin drug induced muscle pain
- Good DNA repair function for the ATM gene - Improved DNA repair for sun damage for the MDM2 gene
- Good DNA repair for colon health
- Good muscle strength
- Improved stress response for heart health
- Good F5 gene function for a lower probability of deep vein thrombosis
- Good Lp(a) function for the LPA gene
- Excellent PON1 gene function for pesticide detoxification

WEAKNESSES
- Higher risk of gluten sensitivity due to variants in HLA gene
- Lower bifidobacteria levels in the gut that may decrease B12 absorption and GABA production due to variants in FUT2 genes
- Higher sensitivity to stress and increased need for folate for MTHFR A1298C variant if there are variants in MTHFR C677T
- Increased sensitivity to excess alcohol, excess sugar, anesthesia, the birth control pill and heavy metals due to homozygous MTR gene function
- Higher sensitivity to proton pump inhibitors and low calcium intake for B12 absorption due to homozygous variant in GIF
- B12 transportation may be affected if lithium levels are low due to homozygous TCN2 gene variant
- Slow glutamate to GABA conversion due to numerous variants in the GAD1 genes and potentially higher chance of anxiety/panic attacks from antibiotics if FUT2 gene function is compromised
- More dietary antioxidant protection needed for the mitochondria due to variants in SOD2
- More dietary antioxidant protection needed to protect the cell membranes due to variants in SOD3 gene
- Higher sensitivity to chemical assaults on the breast, lung or prostate due to variants in GSTP1
- Higher sensitivity to vitamin K2 induced deficiency from antibiotics and the blood thinner Warfarin due to variant in VOKRC1*2 gene
Your genetic report showed an increased need for the following based on the highest amounts of vitamins and minerals. These are based on foods with the highest levels of these nutrients and do not take into account any food allergies beyond gluten and lactose.

<table>
<thead>
<tr>
<th>VITAMINS, MINERALS AND OTHER COMPOUNDS</th>
<th>FOODS TO EMPHASIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium</td>
<td>Gerolsteiner mineral water, spinach, kale, almonds, parsley, and grass-fed dairy</td>
</tr>
<tr>
<td>B6</td>
<td>Wild salmon, wild cod, pistachios, avocados, spinach, Yukon gold or red potatoes, cauliflower, Kombucha and unfiltered fermented drinks</td>
</tr>
<tr>
<td>Glycine</td>
<td>Bone broth, chicken broth and grass-fed whey protein</td>
</tr>
<tr>
<td>B12</td>
<td>Pastured eggs, grass-fed beef, grass-fed lamb, pastured pork, chicken, turkey and seafood</td>
</tr>
<tr>
<td>Riboflavin</td>
<td>Liver, lamb, fish, yogurt and mushrooms</td>
</tr>
<tr>
<td>VO2 Max</td>
<td>Ashwagandha or eleuthero root (check with doctor first)</td>
</tr>
<tr>
<td>Betaine</td>
<td>Spinach, beets and quinoa</td>
</tr>
<tr>
<td>Omega-3's</td>
<td>Fish, fish oil and pastured eggs</td>
</tr>
<tr>
<td>Calcium</td>
<td>Gerolsteiner mineral water, spinach, kale, almonds, parsley, and grass-fed dairy</td>
</tr>
<tr>
<td>Folate</td>
<td>Broccoli, romaine lettuce, beets, liver, turnips, collard greens, spinach, hummus, pomegranates, sprouted lentils, parsley, potatoes, strawberries, oranges and unfiltered fermented drinks</td>
</tr>
</tbody>
</table>
### RECOMMENDED BLOOD TESTS

These are recommended routine blood tests based on your genetic results. These recommendations do not mean that these markers will be out of range, but may be relevant.

<table>
<thead>
<tr>
<th>RECOMMENDED BLOOD TESTS</th>
<th>BLOOD WORK DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>B12</td>
<td>If poor B12 status is suspected, methylmalonic acid (MMA) levels may be needed to accurately assess B12 status, absorption, and requirements</td>
</tr>
<tr>
<td>Vitamin D</td>
<td>Vitamin D should be between 35-50 ng/ml</td>
</tr>
</tbody>
</table>
SAMPLE REPORT

METHYLATION CYCLE

B12, CALCIUM, LITHIUM, B6 & FOLATE:
Heart Health, Reproductive Health, Brain Health, Pregnancy

CHOLINE:
Liver & Brain Health, Gallbladder, Pregnancy

ZINC:
Mental Health, Skin Health, Immune Health

MAGNESIUM & VITAMIN C:
Heart Health, Adrenal Health, Mental Health
Folate-MTHFR 677

**Improves MTHFR C677T Gene Function**: Riboflavin and methylfolate.

**Decreases Gene Function**: PPI’S, birth control pills, NSAIDs, anticonvulsants, antivirals, antibiotics and acid blockers/antacids.

**Research**: If you have a heterozygous MTHFR 677 (30% reduced function) or homozygous (50% reduced function) gene, your methylfolate requirement is higher. Reduced levels of methylfolate lead to decreased production of neurotransmitters, reduced conversion of homocysteine to methionine, and reduced s-adenosylmethionine (SAMe) concentrations. Multiple studies have considered riboflavin status and shown that the MTHFR 677 homozygous genotype is associated with high homocysteine when riboflavin (B2) status is low.

Homocysteine is a non-protein amino acid that is created and recycled in the methylation cycle. Sluggish enzymes in the cycle can cause elevated levels in the blood, which can cause inflammation in the blood vessels. High homocysteine has been implicated in amyloid buildup, DNA damage and cancer, mitochondrial dysfunction, cardiovascular disease, and apoptosis of neurons. Targeting the slow enzymes with methylfolate helps bypass it and can maintain normal levels of homocysteine.

It is important to consider riboflavin intake, PEMT, MTR/MTRR, BHMT and CBS activity to assess overall homocysteine metabolism. Too high or too low levels of B12, B6, folate or their co-factors may cause dysregulation of methyl donor activity. The amount of methylfolate used in studies to reduce homocysteine with MTHFR variants has been 400-800mcg, and should be used with B12, B2 and B6.