NOURISH
NUTRITION OPTIMIZATION PLAN

WWW.TOOLBOXGENOMICS.COM

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Your Results

Toolbox Genomics (TBG) is excited to provide you with your personalized Health Action Plan™. This report is personally customized based on your DNA test results, as well your personal medical history, family medical history, gender, and ethnic background.

The information contained within this report was selected based on strict criteria following FDA and scientific guidelines. In order to provide the most valid and effective recommendations, TBG uses a grading system to identify and choose high quality research studies over others of lower quality. Following these criteria, only human-based studies are included. Additionally, all research is also assessed to determine how easily individuals can implement the recommendations and allow for the individual to collaborate with their healthcare provider to establish next steps for the health of their genes.

This report is based on an evaluation of the customer’s Single Nucelotide Polymorphisms (SNPs), which are variants in an individual’s genetic make-up that may be associated with various health and wellness attributes. Because of our rigorous literature review process, we do not report SNPs that don’t meet our standards for scientific evidence. We are continually adding new SNPs to our report. If you do not see a particular SNP, more than likely we are working on finding high quality research for you to use. Be sure to check back on our website to see our new updates.

All recommendations in this report are chosen because they are actionable, meaning you will be able to directly apply the information from your Health Action Plan™ to improve your wellness. The recommendations included within our reports address the areas:

- Nutrition
- Supplements
- Exercise
- Lifestyle factors
- Further testing guidelines

You may already be following some of the suggestions in our report, if that is the case, good for you, keep going! If not, we hope that you find this report to be useful, actionable, and helpful.

Finally, the information provided within this report is for educational purposes only and not intended to diagnose or treat any disease or condition. Your health depends on a variety of factors, including genetics, diet and exercise, sleep, environmental factors, and other traits. It is always a good idea to talk to your healthcare provider before changing your health routine, including your diet, supplement use, or exercise regimen.

In the following pages, you will discover information regarding your individual genetic results, as well as specific and actionable recommendations to optimize your genetic potential.
Some Definitions To Get You Started

**DNA**: The hereditary material in humans included in nearly every cell throughout the human body. Your DNA is responsible for storing biological information as a code, which is made up of four base pair (Adenine (A), Thymine (T), Guanine (G), and Cytosine (C)).

**Genes**: Basic units of heredity that are made of DNA and act as instructions to make all of your body proteins. Humans have between 20,000 - 25,000 genes, half of which come from one’s mother and the other half from one’s father.

**Alleles**: Different forms of the same gene with small differences in the sequence of DNA bases. Some alleles contribute to the way you look, your eye color, hair texture and even how your environment affects your body. Alleles make you unique. Alleles come in 2 forms: heterozygous and homozygous. Heterozygous means that you have base pairs with different letters, e.g. AT. Homozygous means that you have base pairs with the same letters, e.g. CC.

**SNPs**: A SNP is also called a Single Nucleotide Polymorphism. Your DNA consists of 4 main building blocks (Adenine (A), Thymine (T), Guanine (G), and Cytosine (C)). In certain locations within your DNA, one person may have an A, whereas another may have a G. This difference in the base pair is often called a variant. This variant is a SNP. SNPs can be common and include genetic variants that occur in >1% of the population.

What Your Report Contains

Your report contains two important areas of information:

1. Descriptions of your genetic information and what this could mean for you.
2. Personalized and actionable science-based recommendations to take control of your environment and potentially overcome your genetic predispositions.

<table>
<thead>
<tr>
<th>SNP</th>
<th>RSID</th>
<th>Your Result</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
<tr>
<td>FTO</td>
<td>rs9939609</td>
<td>AT</td>
<td>Variant</td>
</tr>
</tbody>
</table>

Each section of your report will detail your genetic information for any genes that we test related to that specific trait. You will see the gene tested, the corresponding genetic variant (SNP), your personal allele, or form of the gene tested, and finally what this means for you. Detailed descriptions of this information are found below each table.

Extensive scientific research was conducted in order to formulate the best recommendations for you to maximize your health, despite certain potential genetic predispositions. Your genes will not change, but the expression of your genes, which directly impact your health, can change with environmental factors, such as nutrition, exercise, and other lifestyle factors. Your genes are not your destiny and we designed these recommendations to help you take control of your health!
# Essential Nutrients

## Vitamin B12

### Your Health Information

**What This Genetic Marker Means:** People with similar genetic markers may be predisposed to low vitamin B12 levels.

### Condition Definition

**The Details:** Vitamin B12 aids in the development and function of the brain, nerves, blood cells, and DNA. Having low vitamin B12 levels may result in poor memory, depression, sleep deprivation, and neuropathic (nerve) pain. Individuals who eat a vegetarian or vegan diet are at increased risk for B12 deficiency. [More information]

### Your Gene Variation

<table>
<thead>
<tr>
<th>SNP</th>
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<th>Your Result</th>
<th>Effect</th>
</tr>
</thead>
<tbody>
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<td>Variant</td>
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<td>Non-Variant</td>
</tr>
<tr>
<td>FUT2</td>
<td>rs602662</td>
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<td>-</td>
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<tr>
<td>FUT2</td>
<td>rs1047781</td>
<td>AA</td>
<td>Non-Variant</td>
</tr>
</tbody>
</table>

### Gene Definition

**CUBN:** is a gene that makes a protein called cubilin. Cubilin helps your body take in vitamin B12 from food or from B12 made by bacteria in the intestines. People with variations in the CUBN gene may have certain types of anemia and have lower vitamin B12 levels.

**TCN1:** (TRANSCOBALAMIN I) is a gene that helps bind a particular form of vitamin B12 to its transport protein and carry it into cells. A change in this variant may lead to vitamin B12 deficiency and high levels of homocysteine.

**FUT2:** (fucosyltransferase 2) is a gene that creates a protein involved with the attachment of H. pylori bacteria. The attachment of H. pylori bacteria to the stomach’s mucous lining prevents the body from absorbing B12. Additionally, individuals with this gene may also have lower bifidobacteria (a beneficial probiotic that makes B12), therefore individuals may have lower vitamin B12 levels.
Essential Nutrients

Vitamin B12

What You Can Do

**Vitamin B12**

Typical Levels: 186 pmol/L to 650 pmol/L
B12 sufficiency starts at levels above 300 pmol/L

**Vitamin B12-Rich Food**

Increasing foods rich in vitamin B12 can help bring B12 levels up. Foods rich in B12 include:

- Dairy products such as whole fat yogurt, cottage cheese, cheese, and milk.
- Fish such as salmon, mackerel, herring, tuna, sardines, and trout.
- Lean pastured meats, egg yolks, and organ meats (liver).
- Shellfish such as clams and crab.

**Vitamin B12**

A typical starting dose is 500 mcg. The amount of vitamin B12 you need depends of your age, your genes, and the amount of acid in your stomach, since low stomach acid lowers your ability to absorb B12.

**Pro Tip**

Check the label for the words hydroxyl or methyl before the B12. These are the most effective types of B12 supplement.

A liquid form is best because a person’s body starts absorbing B12 in their mouth.

**Methylmalonic Acid**

Typical Levels: 0 µmol/L to 0.11 µmol/L
Levels under 0.11 µmol/L are potentially considered signs of elevated B12. [More Information]