GX nutrient™ Personal Report

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VICTORY HEALTH & WELLNESS

Welcome to Your GxNutrient Personal Report

GxNutrient Personal Report
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Congratulations!

You are about to receive insights about your body that, up until now, have never been available. The science of the human body only recently evolved enough to allow scientists to identify and analyze a person's DNA. We not only provide you with a roadmap of your specific genes, but give direction on how you can potentially optimize your health and well-being with this knowledge.

We spend a lifetime trying to learn more about ourselves, especially how our body works and how our health is affected by our habits and behaviors. Traditionally, we have learned what works and what doesn't through trial and error. But experience alone doesn't always give us the information we need.

This report will provide you with results that can affect the way your body functions. Your report includes an analysis of your genotype for certain key genes that are related to micronutrient (vitamins and minerals) tendencies.

What is Genetic Testing?

Genetic testing utilizes a physical specimen from the body (saliva, blood, or other tissues) to reveal information about a person's chromosomes or their genes. In addition to identifying key genes, information is evaluated about areas on each gene that may differ between people. These areas are known as single nucleotide polymorphisms (SNPs). We use the term genotype to describe the outcome of your individual genetic tests.

How Are Your Results Determined?

We provide a genetic analysis that indicates which gene combinations you have in each category. You will receive a rating based on our calculated score for each trait in a category. Some categories only have one gene associated with that trait; other categories have several genes associated with that trait. Our calculated score reflects the potential combined influences from one or more genes.

There is a tendency to view genotype results as a definitive diagnosis and to assume that you absolutely have certain traits, when this is not what a genetic analysis measures. Your results only suggest that there is a greater or lesser chance that you may exhibit certain traits or responses.

Why Is Your Genotype Important?

To empower you with the best genetic testing knowledge possible, we have established stringent criteria for studies that we use to help us evaluate the potential impact of your genotype for each gene tested. We select the largest and most scientifically valid genome-wide association studies to calculate a score for the different genes or gene combinations for all genes tested. Your results indicate which gene combinations you have in each category, and you receive a rating for each trait in a category. The studies we used as the basis for our recommendations are available for reference in this report.

Personalized medicine, or individualized advice based on a person's genetic profile, is still in its infancy, because there is still much to be understood about genes and their interactions with each other and other influences such as diet, exercise and the environment. Genetic research is a relatively new field and many new discoveries are being made every day. We will maintain a continually updated research database, with analyses that will be modified as new and better research becomes available.

On the following pages, you will see a summary of your results, followed by a detailed explanation and success strategy. You can't change your genes. But you can control the diet and lifestyle behaviors that influence those genes and take steps starting today to minimize genes that may cause undesirable outcomes and to maximize your health and wellness genetic potential.

REPORT SUMMARY

VITAMINS

MINERALS

REPORT SUMMARY

VITAMINS

Vitamin A Tendency	NORMAL	BCMO1
Vitamin B6 Tendency	NORMAL	NBPF3
Vitamin B9 – Folate Tendency	NORMAL	MTHFR
Vitamin B12 Tendency	ABOVE AVERAGE	FUT2
Vitamin C Tendency	NORMAL	SLC23A1
Vitamin D Tendency	NORMAL	GC, NADSYN1, CYP2R1
Vitamin E Tendency	NORMAL	ZPR1, SCARB1, CYP4F2
Dietary Choline Tendency	INCREASED	PEMT

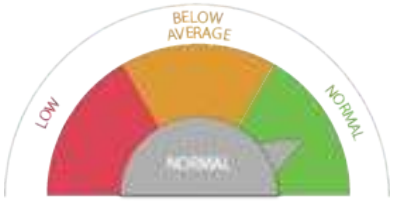
MINERALS

Calcium Tendency	NORMAL	CASR, DGKD, GCKR, LINC00709, CARS, LOC105370176, CYP24A1
Copper Tendency	BELOW AVERAGE	SMIM1, SELENBP1
Iron Tendency	NORMAL	TRF2, HFE, HFE, TMPRSS6
Magnesium Tendency	NORMAL	MUC1, SHROOM3, TRPM6, DCDC5, ATP2B1, MECOM
Phosphorus Tendency	ABOVE AVERAGE	ALPL, CSTA, IHPK3, PDE7B, C12orf4, IP6K3
Selenium Tendency	NORMAL	DMGDH
Zinc Tendency	NORMAL	CA1, PPCDC, LINC01420

VITAMIN A TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits a **NORMAL** ability to process vitamin A from a beta-carotene supplement. Your score reflects the fact that, for the gene investigated, your genotype showed few, if any, of the allele combinations that showed a diminished response to converting high doses of beta carotene from a supplement into its more active form.



Your genetic profile indicates that your response is NORMAL.

This suggests that your ability to convert high doses of beta-carotene from a supplement into an active form of Vitamin A is unlikely to be reduced.

This means that if you take a beta-carotene supplement, your ability to convert the nutrient into an active form of vitamin A is not likely to be reduced. It is unclear what this genotypesuggests about converting beta-carotene from food sources, however.

SUCCESS STRATEGIES

Vitamin A is needed for good vision and needs may increase in women who are pregnant or lactating. It is easy to get vitamin A in foods, and the plant forms of beta-carotene also act as a free-radical fighting antioxidant. Based on this result, it appears that you are unlikely to have problems converting beta-carotene into the active form of vitamin A. But do make sure to get enough beta-carotene and/or vitamin A from foods you eat.

RELATED GENES / SNPS

BCMO1

The gene and its associated SNPs that are included in this category have been shown to have statistically significant associations with a person's blood levels of Vitamin A. Vitamin A promotes good vision, is involved in protein synthesis that affects skin and membrane tissues, and helps support reproduction and growth. The nutrient is found in plant foods in its precursor forms such as beta-carotene. Beta-carotene is converted by the body into different active forms of Vitamin A: retinol, retinal and retinoic acid. Animal foods, such as meat and dairy, provide the retinol form of Vitamin A.

It is rare to overconsume beta-carotene in plant foods to reach toxic levels. However, it is possible to consume toxic levels of Vitamin A from organ meats or fortified foods. Pregnant women are advised to eat liver no more than once every two weeks.

Vitamin A in the form of beta-carotene is found in foods such as vegetables,

VITAMINS

VITAMIN A TENDENCY

especially leafy greens like spinach and orange foods such as carrots, sweet potatoes, apricots, mango and cantaloupe, as well as in the retinol form in dairy and in organ meats like liver.

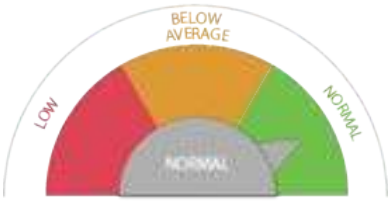
VITAMIN A-RICH FOODS TO INCLUDE IN YOUR DIET:

Broccoli, Swiss chard, collard greens, kale, carrots, butternut squash, apricots, goat's cheese, liver, tuna.

VITAMIN B6 TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile indicates that your response is **NORMAL**. Your score reflects the fact that your genotype showed few, if any, of the unfavorable allele combinations. This means that your blood levels of Vitamin B6 are likely to be normal, assuming that you are getting enough of this vitamin in your diet.



Your genetic profile indicates that your response is NORMAL.

You are likely to have normal blood levels of vitamin B6.

SUCCESS STRATEGIES

Even if you are not at risk for low levels of certain nutrients, it is always important to make sure you get the recommended amounts of nutrients in your diet. Do periodic checks of your nutrient intake by keeping a food log using a dietary app.

VITAMIN B6-RICH FOODS TO INCLUDE IN YOUR DIET:

Pistachios, pinto beans, wheat germ, bananas, watermelon, carrots, spinach, peas, squash, potatoes, avocados, yellowfin tuna, sunflower seeds.

RELATED GENES / SNPS

NBPF3

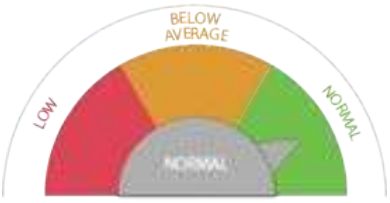
The gene and its associated SNPs included in this category have been shown to have statistically significant associations with a person's blood levels of Vitamin B6. In one large study, people who carried the most unfavorable pairs of genes, or alleles had lower levels of Vitamin B6.

Vitamin B6 is important for nerve cell function, energy metabolism and the production of hormones, such as serotonin and epinephrine. Low levels of B6 are also linked to higher levels of homocysteine, which increases heart disease risk. B6 is found in many foods including grains, legumes, vegetables, milk, eggs, fish, lean meat and flour products.

VITAMIN B9 – FOLATE TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile is **NORMAL**. It appears that you are likely to have normal blood levels of folate. This suggests that you may not have to worry about increased heart disease risk from higher levels of homocysteine.



Your genetic profile indicates that your response is NORMAL.

You appear to be likely to have normal blood levels of folate. To make sure you get enough, make sure to eat plenty of whole plant foods every day.

SUCCESS STRATEGIES

- All women should ensure they get enough folate in their diet. You will get folate that is added to whole grains in cereals and breads, but you should also eat other food sources of folate. The foods highest in folate include legumes, fruits and vegetables, especially greens.

- Smoking can also decrease folate levels. You may need to consume more through food and/or supplements if you smoke — or better yet, quit smoking!

- If you eat few vegetables and fruits, your folate intake and blood levels may be low, despite having a more favorable genotype. You may wish to ask your doctor to assess your levels of serum folate with a blood test.

RELATED GENES / SNPS

MTHFR

This gene and its associated SNPs have been shown to have significant associations with a person's folate, or vitamin B9, status. Folate plays many important roles in the body, including acting as a coenzyme in DNA creation and in energy metabolism reactions. Folate also plays a role in biochemical processes that affect the metabolism of an amino acid, homocysteine. One SNP associated with this gene is associated with enzyme activity that can lead to higher levels of homocysteine. Since homocysteine is a risk factor for heart disease, high levels may be of concern. In child-bearing women, getting sufficient amounts of folate is important because low levels can lead to neural tube birth defects. As a public health measure, grains are fortified with folate to ensure that women of childbearing age get enough. Low levels of folate can also lead to anemia.

In studies on this gene, people who carried the most unfavorable pairs of genes, or alleles, had only a 10%-20% efficiency

VITAMIN B9 – FOLATE TENDENCY

at processing folate. And those with the below average allele had a 60% efficiency at processing folate. People with more of the unfavorable alleles are more likely to have high homocysteine and low Vitamin B12 levels. Poor ability to process folate may be fairly common: Around 53% of women appear to have these unfavorable genotypes.

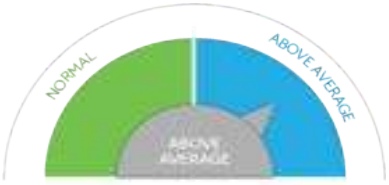
FOLATE-RICH FOODS TO INCLUDE IN YOUR DIET:

Lentils, pinto beans, asparagus and broccoli are excellent sources of folate.

VITAMIN B12 TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic response is ABOVE AVERAGE. Your score reflects the fact that your genotype showed more favorable allele combinations. This suggests that, as long as you consume a healthy diet that includes Vitamin B12, you are likely to have Vitamin B12 levels on the high end of the normal range.



Your genetic profile indicates that your response is ABOVE AVERAGE.

This suggests that your blood levels of Vitamin B12 are likely to be on the high end of the normal range.

Keep in mind, however, that Vitamin B12 deficiencies can develop with some health conditions. Also, aging can result in poorer absorption of Vitamin B12 from foods. If you follow a plant-based vegan diet that does not include fortified foods, levels also can decline over time.

SUCCESS STRATEGIES

If you follow a strict vegan diet getting a nutrient analysis of what you eat can give you an indication of how much vitamin B12 you are consuming. Do periodic checks of your estimated Vitamin B12 intake with a food log using a dietary app.

If you have a known health condition, such as Crohn's disease that can cause poor absorption of vitamin B12, it is a good idea to get periodic testing of your blood levels of Vitamin B12. If absorption is impaired, your blood levels may be low and you may wish to have your blood levels tested and supplement with B12, if necessary.

RELATED GENES / SNPs

FUT2

The gene and associated SNPs included in this category have been shown to have significant associations with a person's blood levels of Vitamin B12. In one large study, those women who carried the most unfavorable pairs of genes, or alleles, had slightly lower levels of Vitamin B12 compared to others with more favorable genotypes. However, they were not deficient: their levels were still in the normal range, just on the low end. Around 70% of people have genotypes that suggest they may be at risk for having blood levels of B12 that are at the lower end of the normal range. There are several reasons why blood levels of B12 can be low. Some people do not get enough in their diet and so they are simply not getting enough of the nutrient. Some other people get enough, but do not absorb it efficiently. A small percentage of people over 50 or those who have had gastrointestinal surgery or GI disorders such as Crohn's disease may also have reduced abilities to absorb it.

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VITAMIN B12 TENDENCY

VITAMIN B12-RICH FOODS TO INCLUDE IN YOUR DIET:

Lean meat, seafood, dairy products, eggs, fortified nutritional yeast, fortified plant milks.

Research also indicates that around 30% of people have genotypes that suggest they may be predisposed to having higher than normal levels of vitamin B12. Their levels are not excessive, just on the high end of the normal range.

Vitamin B12 is important for many processes in the body, including red blood cell formation, neurological function and cognitive performance. Deficiencies of B12 can cause pernicious anemia, and is also associated with high levels of homocysteine, which may impair arteries and increase risk of heart disease. There is some evidence that subclinical symptoms may be associated with being in the low end of the normal range.

Vitamin B12 is produced by microorganisms found in soil and water, and in both the guts of animals and humans. In the modern world, highly-sanitized food processing systems have eliminated many naturally occurring sources of Vitamin B12-providing bacteria in plant products. Vitamin B12 is typically obtained from animal foods such as meat, or fortified foods such as dairy and plant milks. Certain mushrooms and seaweed may provide some Vitamin B12, but are not considered to be reliable sources.

VITAMIN C TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile suggests that you are likely to have NORMAL levels of Vitamin C.Your score reflects the fact that for the gene investigated, your genotype did not show the unfavorable allele combinations. This means that if you consume enough Vitamin C in the foods you eat, blood levels of L-ascorbic acid should be in the normal range. If you smoke, however, you may deplete some of your Vitamin C and may need more.

Your genetic profile indicates that your response is NORMAL

If you eat enough Vitamin C-rich foods, you should have normal levels in your blood.

SUCCESS STRATEGIES

- To ensure your body gets the Vitamin C it needs, make sure to include a wide variety of plant foods, including citrus in your diet.
- If you wish to supplement with Vitamin C, avoid very high doses because they can cause diarrhea and gastrointestinal distress.

VITAMIN C-RICH FOODS TO INCLUDE IN YOUR DIET:

Broccoli, red bell peppers, kiwi fruit, Brussels sprouts, strawberries, oranges, watermelon, pinto beans.

RELATED GENES / SNPs

SLC23A1

The gene and associated SNP included in this category has been shown to have statistically significant associations with a person's blood levels of L-ascorbic acid, or Vitamin C. Those people who carried more unfavorable pairs of genes, or alleles, were more likely to have lower blood levels of the nutrient compared to those with different genotypes, although they were not deficient in Vitamin C.

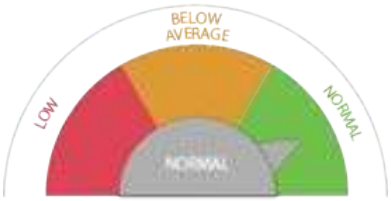
Vitamin C is a nutrient that has many functions in the body, including acting as an antioxidant. It is also needed for skin and membrane tissues. Low levels have also been associated with diseases such as heart disease and cancer and deficiencies cause scurvy. Vitamin C also helps with the absorption of iron.

This nutrient must be obtained from foods since the human body cannot make its own (as some other animals can). Vitamin C can be found in citrus fruits, but is also in many fruits, vegetables and legumes.

VITAMIN D TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic response is **NORMAL**. Your score reflects the fact that for the genes investigated, your genotype showed few, if any, of the unfavorable allele combinations. This means that, assuming you get adequate sun exposure or Vitamin D from dietary sources, your risk of being deficient in Vitamin D is low.



Your genetic profile indicates that your response is NORMAL.

Make sure to get enough sunlight each week to keep Vitamin D levels in the acceptable range.

SUCCESS STRATEGIES

- Expose yourself to the sun on most days of the week for at least 10 to 15 minutes (30 to 50 minutes if you have naturally dark skin). Spend more time outdoors in winter months, or if you live in northern latitudes.

- Get a blood test from your doctor to determine your nutrient levels. If you are deficient in Vitamin D, do a nutrient analysis to determine how much Vitamin D you consume, then eat more foods containing Vitamin D or take supplements.

RELATED GENES / SNPS

GC, NADSYN1, CYP2R1

The genes and their associated SNPs that are included in this category have been shown to have statistically significant associations with a person's blood levels of Vitamin D (which is actually a hormone). One study found that several SNPs linked to low levels of Vitamin D were from genes that may play a role in the Vitamin D conversion and delivery process. Those people who carried unfavorable pairs of genes, or alleles, had a higher risk of low levels of Vitamin D, and those who carried several unfavorable SNPs had a much higher chance of being deficient in Vitamin D.

Vitamin D has been proven in research to be crucial for bone health. Low levels of Vitamin D have been associated with a variety of health conditions, including heart disease, diabetes, depression and cancer.

A blood test from your doctor can determine your blood levels of Vitamin D. Vitamin D is primarily produced by the

VITAMINS

VITAMIN D TENDENCY

VITAMIN D-RICH FOODS TO INCLUDE IN YOUR DIET:

Salmon, mackerel, sardines, egg yolks, fortified almond, soy or other plant milk, fortified dairy milk.

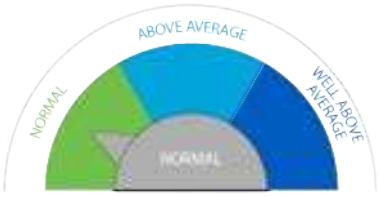
body from exposure to ultraviolet rays from sunlight, and this is considered to be the optimal source since Vitamin D generated by the body lasts longer in the body than Vitamin D taken in supplement form. Your levels are likely to be higher if you live in the southern latitudes and during the summer. However, it is not uncommon for people with lots of exposure to the sun to still have low levels of Vitamin D. In general, only 10 to 15 minutes of sun exposure to bare skin per day during the summer months is needed for a Caucasian to produce the Vitamin D he or she needs. Darker skinned people will need to spend 2-5 times more time in the sun. Since Vitamin D is stored in the body, stores can be built up during warmer months and may compensate for less sun exposure during winter months.

Vitamin D can be obtained through foods such as oily fish and egg yolks, as well as fortified dairy and plant milks, and fortified cereals. Vitamin D can also be taken in supplements. If you test low and choose to take a Vitamin D supplement, be careful of taking higher doses because there can be adverse effects.

VITAMIN E TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that make you likely to have NORMAL vitamin E levels. That's good because this micronutrient helps make red blood cells, boosts immunity, and is a powerful antioxidant that provides protection against serious chronic diseases such as heart disease and cancer. Because research shows that many Americans may fall short of the 15 milligrams Daily Recommended Value for vitamin E, it's important that you eat a diet that includes vitamin-E rich foods to get the amount you need for optimum health benefits. This is especially important if you tend to watch your fat intake.



Your genetic profile indicates that your response is NORMAL.

Your genetic profile indicates that you are likely to have NORMAL blood levels of vitamin E. That does not mean that you are immune to having lower than optimum levels of this powerful antioxidant, however. So it's important to ensure you include vitamin-E rich foods in your diet every day.

SUCCESS STRATEGIES

Some national surveys show that the majority of Americans fail to get the recommended amount of vitamin E every day. Though you are likely to have average levels of this essential antioxidant, that doesn't mean you're getting as much as you could or should to help keep you healthy and protect against disease. The following strategies will help ensure you get the daily dose of vitamin E you need.

Eat more nuts and seeds. One of the easiest ways to get all the vitamin E you need is eating more nuts, seeds, and nut and seed butters and spreads. Just a handful of almonds delivers more than a third of your daily recommended dose of 15 milligrams. This may partly explain why research on more than 76,000 men and women found that eating more nuts was associated with lower death rate from all causes, including cancer and heart disease.

RELATED GENES / SNPS

ZPR1, SCARB1, CYP4F2

The genes and their associated SNPs included in this category have been shown to have significant associations with a person's serum vitamin E (alpha-tocopherol) levels.

Vitamin E is a fat-soluble vitamin that helps your body make red blood cells and acts as a potent antioxidant, protecting your cells from free radical damage and helping prevent chronic diseases such as heart disease, diabetes, and cancer. Vitamin E exists in many forms. Alpha-tocopherol is the form we use as humans.

Diseases that interfere with fat absorption, such as Crohn's disease and cystic fibrosis, may lead to vitamin E deficiencies, but otherwise vitamin E deficiency in healthy individuals without underlying health conditions is rare. That's not to say that we all get adequate amounts of this vital nutrient, however. Though national surveys are mixed, some have found that most Americans miss the minimum RDA of 15

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VITAMIN E TENDENCY

Drizzle your green leafy veggies with olive oil. Cooked spinach and broccoli are good sources of vitamin E, but the vitamin isn't absorbed very well without some fat. Drizzle olive oil—another good vitamin E source—over your sides and salads to increase your antioxidant absorption. Or eat them with sliced avocado, which also is a good source of both healthy fat and vitamin E.

Eat whole grain foods. Wheat germ is one of the best natural sources of vitamin E. Few people actually eat wheat germ, but you can get the vitamin E from wheat by choosing whole grain foods, as opposed to refined grains, which have up to 90 percent of their vitamin E stripped out in processing.

VITAMIN E-RICH FOODS TO INCLUDE IN YOUR DIET:

Almonds, spinach, sweet potato, avocoda, wheat germ, palm oil sunflower seeds

milligrams (22.4 IU), with the average American getting half that amount, especially if they restrict fat—an important vitamin E source—in their diet.

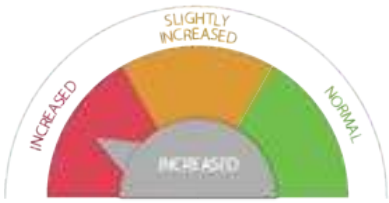
Because there are only a few foods—notably nuts and seeds—that are rich in vitamin E, people concerned with getting enough of this antioxidant often choose to take vitamin E supplements. The research on vitamin E supplementation, however, is equivocal. One study of nearly 40,000 women followed for 10 years found that women taking 600 IU of natural vitamin E supplements had a 24 percent reduction in cardiovascular deaths. Another study of almost 15,000 men, however, found that those taking 400 IU of synthetic alpha-tocopherol not only saw no benefit, but also had a significantly higher risk of stroke. Other evidence indicates that high-dose supplements may also increase the risk for prostate cancer. (Taking vitamin E supplements is also not advised if you take other blood thinners as it increases risk for bleeding.)

Though diet is the primary factor that influences your serum vitamin E levels, research indicates that your genes also may have some influence. Some individuals also appear to be genetically more responsive to vitamin E supplementation than others. Since some research has linked taking high doses of vitamin E supplements to higher risks of the same diseases they're intended to prevent, knowing your genotype may be beneficial. Our analysis investigated which genotype for these genes was present in your DNA. Your rating of NORMAL, ABOVE AVERAGE, or WELL ABOVE AVERAGE reflects your likelihood of having normal or high blood serum levels of vitamin E.

DIETARY CHOLINE TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that give you an INCREASED sensitivity to low choline intake. That means you are significantly mo e likely to experience organ dysfunction like fatty liver and/or muscle damage in response to eating a diet that is low in choline. Surveys show many adults, especially older adults, fall short in their choline intake. Because of your genetic predisposition, it's particularly important that you avoid low choline levels by increasing your intake of choline-rich foods. Since animal foods are the primary source in the US diet, pay especially close attention to this nutrient if you follow a vegetarian or vegan diet.



Your genetic profile indicate that you have an INCREASED sensitivity to a low-choline diet.

Since you are more likely to suffer organ dysfunction and muscle damage should your choline intake fall below recommended levels, you should make it a priority to eat plenty of choline-rich foods for optimum cell, nerve and organ function.

SUCCESS STRATEGIES

We all create a small amount of choline as part of our normal metabolism. But you also need to eat foods with this essential nutrient to get adequate amounts for healthy cell, nerve, organ and muscle function. As someone who is genetically inclined to be very sensitive to the effects of a low-choline diet, it's particularly important that you seek out choline-rich foods.

Build a better breakfast. Your morning meal is an easy place to rack up substantial amounts of choline. Two eggs (147 mg each) and a cup of milk (38 mg per 8 oz) deliver 332 mgs of this essential nutrient. As a reminder, the US Dietary Guidelines lifted the limits on dietary cholesterol, so you can eat your omelet guilt free.

RELATED GENES / SNPs

PEMT

This gene and its associated SNPs that are included in this category have been shown to have significant associations with a person's sensitivity to low choline levels in their diet.

Choline is an essential nutrient that your body uses to keep cells and nerves working properly. It is particularly important for maintaining liver, muscle and brain function. It plays an important role in fetal brain development and for preventing neural tube birth defects.

The Institute of Medicine recommends 425 mg (women) to 550 mg (men) of choline per day. Pregnant women need 450 mg a day. Choline is found in many foods, but is most prevalent in animal foods like eggs, liver, fish and meats. Low levels of choline can lead to organ dysfunction, particularly fatty liver, and muscle damage.

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DIETARY CHOLINE TENDENCY

Be more mindful if you don't eat meat. If you're a strict vegetarian or vegan, you may be at a higher risk for low dietary choline. Soymilk provides 57 mg per cup and is a good source. Other choline-rich foods to include in your diet are fortified grain products, quinoa, peanut butter, pistachios, tofu, broccoli, Brussels sprouts and wheat germ.

Consider a supplement. If your diet runs low in choline-rich foods, you may want to consider taking a choline supplement to ensure you reach your adequate intake.

DIETARY CHOLINE-RICH FOODS TO INCLUDE IN YOUR DIET:

Egg, beef, shrimp, scallop, salmon, beef liver, chicken, cauliflower, cabbage

A study published in 2009 in Nutrition Reviews reported that the average choline intake among men and women is below Adequate Intake. Women appear most likely to fall short. Though some people will not develop adverse symptoms from eating a low choline diet, certain genetic variations (specifically carrying the C allele, especially being homozygous or carrying identical CC alleles) make you far more susceptible to organ dysfunction and muscle damage if you fall below the advised amounts. Research suggests that up to 75 percent of the population may have DNA configurations that level them susceptible to choline deficiency. This effect is particularly pronounced in women, particularly post-menopausal women, as estrogen appears to exert protective effects.

Our analysis investigated which genotype for this gene was present in your DNA. Your rating of NORMAL, SLIGHTLY INCREASED or INCREASED reflects the degree to which you are susceptible to organ dysfunction and muscle damage in response to having low dietary intake of choline.

CALCIUM TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that make you likely to have NORMAL blood levels of calcium. That means you likely have adequate circulating calcium in your bloodstream so your body doesn't have to leech it from your bones to maintain healthy cellular function. You should continue getting 1,000 mg (men) to 1,200 mg (women) of calcium a day through a vitamin and mineral-rich diet.

Your genetic profile indicates that you are inclined to have NORMAL blood levels of calcium.

Continue eating a healthy diet and maximize your skeletal health with bone-building lifestyle and exercise habits.

SUCCESS STRATEGIES

Our bodies become less adept at absorbing calcium as we age, so it's important to continue eating a diet that is rich in this essential mineral as well as to perform healthy lifestyle practices to keep your skeleton strong.

Consume more calcium. Some food sources of calcium are dairy, canned fish like salmon and sardines, tofu, almonds and fortified alternative milk products., as well as collard greens, kale and spinach.

Skip supplements. Calcium supplements have been the topic of considerable controversy in recent years. Some research finds that they are not useful for preventing fractures and may be linked to increase risk for heart disease. You can get plenty of calcium in your diet and your genotype does not call for additional amounts.

Stay active. Be sure to get regular "impact" exercise like jogging, tennis, or strength training. Your bones need some stress to get the signal to grow. Every time you load or add resistance to your bones, they release calcium into your blood. That calcium is then circulated and sent back to your bones

RELATED GENES / SNPs

CASR, DGKD, GCKR, LINC00709, CARS, LOC105370176, CYP24A1

The genes and their associated SNPs that are included in this category have been shown to have significant associations with a person's blood calcium levels.

Calcium is the most plentiful mineral in the human body and is used by nearly every cell in the body. It's well known that the mineral is essential for maintaining skeletal and dental health, as your bones and teeth are where the lion's share of calcium is stored. Calcium also is required for nerve function, muscle contraction, hormone release and heart health.

Your body keeps the amount of calcium circulating in your bloodstream within a certain range to allow all your specific cells to have what they need to perform their jobs. When those levels dip below that range, your body pulls what it needs from your skeleton. Over time that leads to weakened bones.

Your calcium levels are influenced by your diet, how well your intestines absorb the calcium you take in, levels of phosphate

CALCIUM TENDENCY

which then grow and become stronger. So these activities help keep them strong. Strength training two or three days a week has also been shown in studies to help build and maintain bone density.

CALCIUM-RICH FOODS TO INCLUDE IN YOUR DIET:

Milk, almonds, okra, broccoli cheese, kale, yogurt

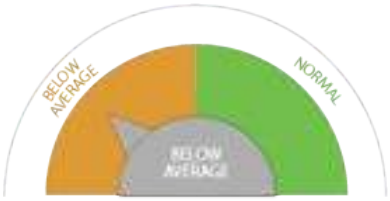
in the body, your vitamin D levels and by levels of certain hormones like parathyroid hormone, calcitonin and estrogen. Emerging research also shows that your genotype may influence blood calcium levels. In one very large study of 39,400 men and women, researchers found variations in these genes had a significant impact on blood calcium levels, which echoes findings from previous animal research as well as a study of 1,747 twins that estimated heritability to be 33 percent for blood serum calcium levels.

Our analysis investigated which genotype for these genes was present in your DNA. Your rating of NORMAL or BELOW AVERAGE reflects whether or not your genotypes included those that increased your risk for low blood calcium levels.

COPPER TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that make you likely to have a BELOW AVERAGE blood copper level. It's important to maintain a healthy level of this essential mineral as it plays a key role in red blood cell production, immunity and the formation of collagen, which is necessary for maintaining healthy bones and connective tissues. Fortunately, there are many ways to boost your intake of copper to get the daily 900 micrograms you need to achieve and maintain healthy blood levels. The upper limit before copper becomes toxic is quite high, so even if you get a bit more from food, that's okay.



Your genetic profile indicates that you are likely to have a BELOW AVERAGE blood level of copper.

You can boost your blood levels by taking steps to get and maintain more copper in your diet by eating a diet rich in copper and adopting other healthy lifestyle habits that will ensure you obtain adequate amounts of this essential mineral.

SUCCESS STRATEGIES

Many people do not get the optimum amount of copper in their daily diet. It's particularly important for your genotype to seek out foods that are rich in copper to maintain healthy levels.

Eat more copper heavy hitters. Good sources of copper include: Shellfish such as oysters, clams, mussels, crab and lobster Mushrooms Tree nuts such as cashews, pecans, almonds, and macadamia nuts Legumes such as navy beans, peanuts, lentils, and soybeans Fortified cereals and whole grains Dark leafy greens Potatoes and sweet potatoes Dried fruit Cocoa and semi-sweetened chocolate

Cook with copper.* Additional copper can come from boiling water in a copper kettle and cooking with copper cookware.

RELATED GENES / SNPs

SMIM1, SELENBP1

The genes and their associated SNPs that are included in this category have been shown to have significant associations with a person's blood copper levels.

Copper is an often overlooked essential mineral that helps your body absorb iron and form red blood cells, maintains immunity, assists with energy production and helps keep bones, connective tissues, nerves and blood vessels healthy. The recommended daily amount is 900 micrograms a day. Copper is toxic in very high doses and toxicity is most often associated with a rare condition called Wilson's disease. Chronically low copper levels can pave the way for heart disease, poor bone and joint health and low immunity. Marginal to low levels of copper may occur with too much zinc supplementation (popular in the prevention and treatment of colds), dietary deficiencies and in some cases because of genetic influences.

MINERALS

COPPER TENDENCY

Take a multivitamin. A standard daily multivitamin will provide about 25 percent of your daily copper needs.

Avoid high doses of iron, zinc and vitamin C. Taking high doses of zinc and vitamin C for colds as people sometimes do isn't recommended if you trend toward low blood levels of copper. Research suggests that 50 mg a day of zinc and 1500 mg a day of vitamin C can interfere with copper absorption, as can high levels of iron.

COPPER-RICH FOODS TO INCLUDE IN YOUR DIET:

Dried apricots, dark chocolate, mushrooms, turnip greens, asparagus

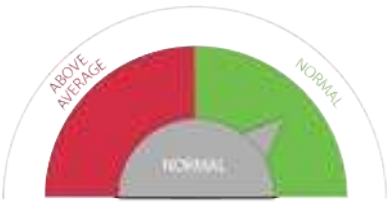
In one widespread analysis of more than 12,000 adults, genetic variations accounted for 5 percent of variation in blood copper levels. That's a small percentage, but can be significant when considering a trace mineral. Surveys also suggest that while true deficiency isn't common, many people don't get enough copper in their diet and taking high amounts of zinc, iron or vitamin C can cause an unfavorable copper blood levels.

Our analysis investigated which genotype for these genes was present in your DNA. Your rating of NORMAL or BELOW AVERAGE reflects whether your genotype included those that carried a risk for having low levels of this essential mineral.

IRON TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that make you likely to have NORMAL blood iron levels. That's good because without enough iron, your blood can't carry the oxygen your cells need to function. You should continue eating a healthy diet that includes iron-rich foods such as lean meat, poultry and fish as well as dried beans, lentils, whole grains and fortified cereals to ensure you get the amount you need each day (8 milligrams a day for adult men and women over 50; 18 milligrams a day for women 19 to 50). This is especially important if you are a premenopausal woman and/or follow vegan diet, as these raise your risk for becoming iron deficient.



Your genetic profile indicates that you are likely to have NORMAL blood levels of iron.

That does not mean that you are not at risk for running low or developing iron-deficiency anemia, so it's important to maintain healthy mineral levels by eating an iron-rich diet.

SUCCESS STRATEGIES

The majority of adults in the US get ample amounts of iron through their usual daily diet. There are some exceptions, however. Premenopausal women, especially those with heavy menstrual cycles, and vegetarians, particularly vegans, run higher risks of becoming iron deficient and developing anemia. The human body is good at storing iron and too much can be toxic, so it's not a good idea to supplement iron without consulting your doctor. But you can follow some iron-smart strategies to be sure you're getting optimum amounts.

Boost your iron absorption. When it comes to your body's absorption, not all iron is created equal. Your body absorbs heme iron, which is found in animal foods such as meat, poultry and fish is up to three times more efficiently than it does nonhemeiron, which is found in plant-based foods such as leafy greens, beans, nuts, vegetables, whole grains and cereals.

RELATED GENES / SNPs

TRF2, HFE, HFE, TMPRSS6

The genes and their associated SNPs included in this category have been shown to have significant associations with a person's blood iron levels.

Iron is a well-known essential nutrient that most of us associate with energy. That's because along with regulating cell growth and other metabolic functions, iron is vital for producing hemoglobin, a protein your red blood cells use to deliver oxygen throughout your body. Without enough oxygen, all your metabolic functions suffer. On the flipside, too much iron is toxic and can be equally, if not more damaging than having too little and may cause organ damage and raise your risk for diabetes, heart attack, neurodegenerative conditions like Alzheimer's and cancer. Many factors influence your iron levels including diet, gender, age, and activity level. In premenopausal women, the primary cause of iron deficiency is heavy

IRON TENDENCY

However, you can absorb greater amounts of iron from the nonheme iron foods you eat by pairing them with vitamin C-rich foods, as the antioxidant can nearly triple nonheme iron absorption. Try adding bell peppers, red cabbage, and tomatoes to grain dishes and berries to cereals.

Cook with cast iron. Cooking with cast-iron skillets and other cookware can increase your iron levels, as iron is released into your foods as they're being cooked. One study found that foods cooked in iron pots contained more than 16 percent more iron than those cooked in non-stick Teflon pots.

Limit iron blockers. If you avoid meat and low iron is a concern, take extra steps to limit your intake of foods and beverages that interfere with non-heme iron absorption. The biggest offenders appear to be tea, coffee and red wine, all of which contain tannins that bind with iron and carry it out of the body. In one study people who drank tea with a meal reduced their nonheme iron absorption by 62 percent;coffee reduced it by 35 percent.

IRON-RICH FOODS TO INCLUDE IN YOUR DIET:

Spirulina, liver, grass-fed beef, lentils, dark chocolate, sardines, black beans, pistachios, raisins

menstrual bleeding as blood loss means iron loss. High levels of physical activity—especially if it's particularly long and/or strenuous also may lead to a decline in iron levels, especially in women. Vegans and vegetarians also may be at risk for low iron levels, as the iron in plant-based foods (nonheme iron) is harder for the body to absorb than iron from animal sources (heme iron). Older adults, again especially women, generally need less iron to maintain healthy stores than men.

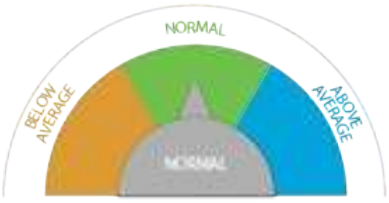
Your genes also may play a role, particularly in the tendency for above normal iron levels. Research has found that certain gene mutations may impact how much iron your body absorbs and recycles, creating borderline or high levels of iron in circulation. At the extreme end is a genetic disorder called hemochromatosis, which occurs in about 10 percent of white people of Northern European ancestry. People with this condition absorb three to four times as much iron from food as those without these genetic mutations. Other mutations can leave you susceptible to amore mild form of hemochromatosis, leading to accumulating slightly higher than average stores of iron.

Our analysis investigated which genotype for these genes was present in your DNA. Your rating of NORMAL or ABOVE AVERAGE reflects whether your genotype included those alleles that were found to lead to a tendency of having normal or high levels of this essential mineral.

MAGNESIUM TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that make you likely to have a NORMAL blood magnesium level. That's good news because magnesium plays an essential role in hundreds of biochemical processes including regulating blood sugar, blood pressure, muscle contraction and heart rhythm. As we age, our body's ability to absorb magnesium decreases, so it's important to eat plenty of magnesium-rich foods to maintain healthy levels of this essential mineral.



Your genetic profile indicates that you are likely to have NORMAL blood levels of magnesium.

You can maintain those healthy blood levels of this essential mineral by eating plenty of magnesium-rich foods and avoiding those that deplete it.

SUCCESS STRATEGIES

Maintain healthy blood magnesium levels by including magnesium-rich foods in your daily diet. Good sources include dark leafy greens, nuts and seeds, fatty fish, avocado, beans, whole grains, yogurt, soy foods and bananas. If you like dark chocolate, you're in luck. One 2-ounce chunk delivers about a quarter of your daily needs. Drink alcohol and coffee in moderation, as both of those can lower magnesium levels by blocking absorption and increasing excretion. Also, skip the soda. Sugary sodas are also linked to lowered magnesium levels.

Though too much magnesium from your diet doesn't pose a problem because your kidneys simply eliminate it in your urine, it is possible to overdo it from supplements and other sources. Overuse of laxatives or antacids can lead to high levels, which can cause diarrhea, nausea and abdominal cramping.

RELATED GENES / SNPs

MUC1, SHROOM3, TRPM6, DCDC5, ATP2B1, MDS1

The genes and their associated SNPs that are included in this category have been shown to have significant associations with a person's blood magnesium levels.

Magnesium doesn't get much attention in mainstream nutrition circles, but it should. The mineral plays a critical role in blood sugar control, muscle contractions and heart rhythm and is involved in more than 300 biochemical reactions in your body.

Some medical experts have recently dubbed magnesium deficiency the "invisible deficiency" because it's very difficult to pinpoint as the most common symptoms such as fatigue and muscle cramping are common side effects of many conditions. It's also very common. Studies show that only about a quarter of US adults get the 320 mg (women) to 420 mg (men) they need.

Though only about 1 percent of your magnesium is found in your blood, low

MINERALS

MAGNESIUM TENDENCY

MAGNESIUM-RICH FOODS TO INCLUDE IN YOUR DIET:

Spinach, pumpkin seeds, yogurt, almonds, black beans, figs, banana, black beans

serum magnesium levels have been associated with multiple chronic diseases such as diabetes, heart disease and high blood pressure. Though low magnesium is generally a condition that occurs over time due to habitually low magnesium intake, high intakes of alcohol, soda and caffeine, and/or taking medications that interfere with its absorption can also cause levels to dip. There's also a genetic influence. Research shows that serum magnesium concentrations are about 27% heritable.

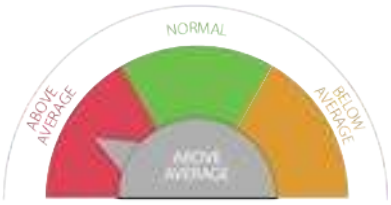
In one study of 15,366 men and women, researchers identified six generariations that were associated with blood magnesium levels. These findings echoed those of another study that found these gene associations in both Caucasian and African American populations. The effects were most pronounced in post-menopausal women and/or people with low insulin levels.

Our analysis investigated which genotype for these genes was present in your DNA. Your rating of BELOW AVERAGE, NORMAL or ABOVE AVERAGE reflects whether your genotype included those that carried a risk of having low levels of this essential mineral or whether you were likely to have adequate levels.

PHOSPHORUS TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that make you likely to have ABOVE AVERAGE blood serum phosphorus levels. That may be a cause for concern because excess phosphorus has been linked to heart disease in numerous studies, including the landmark Framingham Heart Study. Each 0.5 mg/dL above normal levels is associated with a 15% greater risk of cardiovascular events [Did advisory mean above normal?]. Even having phosphorus levels on the high end of normal —or greater than or equal to 3.5 mg/dL—appear to increase your heart disease risk. One 17-year study of more than 3,000 healthy middle aged men and women found that those who had serum phosphorus concentrations in the top quartile of the normal range (greater than or equal to 3.5 mg/dL) had a two-fold higher risk of heart failure than their peers in the lowest quartile (less than 2.9 mg/dL). Elevated phosphorus harms your heart on a few fronts. It hinders your ability to make vitamin D, which increases the calcification in your heart's blood vessels. It also leads to mineral buildup in your vessels, which causes blockages and cardiovascular problems. It also may increase inflammation in the body, which raises heart disease risk. Excess phosphorus levels also harm your teeth and bones, as when phosphorus levels are high, your body pulls calcium from your bones into your bloodstream to restore balance. The resultant high levels of calcium in your blood can exacerbate your heart disease risk as well.



Your genetic profile indicates that you are likely to have a ABOVE AVERAGE blood serum level of phosphorus.

Your genetic profile indicates that you are likely to have ABOVE AVERAGE blood serum levels of phosphorus. This is cause for concern because even high-normal levels can double your risk for heart disease. Excess phosphorus also increases your risk for kidney disease and osteoporosis. Because the American diet can be very high in phosphorus—especially if you eat a lot of packaged and processed foods—it's important to take steps to minimize unhealthy sources of phosphorus, since you are already at elevated risk genetically.

RELATED GENES / SNPs

ALPL, CSTA, IHPK3, PDE7B, C12orf4, IP6K3

The genes and their associated SNPs included in this category have been shown to have significant associations with a person's serum phosphorus levels.

Though it's a mineral that doesn't get much media attention, phosphorus is essential for survival. In fact, phosphorus is found in every cell of your body, makes up 1 percent of your total weight, and is second only to calcium in its abundance in the human body. The most visible evidence of phosphorus' role in your health is your teeth and bones, which the mineral helps form and maintain. It is also essential for energy production. It activates energy-producing B-vitamins and helps the body make ATP, a molecule you use to store energy. It's vital for healthy heart, kidney, muscle, and nerve function.

Your body works to maintain a normal, healthy range of phosphorus—2.5 to 4.5 milligrams per deciliter in your blood (though lab ranges can vary).

MINERALS

PHOSPHORUS TENDENCY

SUCCESS STRATEGIES

Phosphorus is an essential nutrient and prevalent in a well-rounded healthy, whole food diet, so there is no need to curtail any healthy eating habits to keep this mineral in check. However, many food additives are sources of inorganic phosphorus (phosphates), which are very easily absorbed by the body and may wreak havoc on your health, especially if you're already genetically inclined to high serum phosphate levels. A simple blood test will tell you if your levels are high normal or above normal. If high phosphorus is a concern, dietary changes may help.

Can the cola. There are plenty of reasons to cool your cola habit. Here's another: cola drinks contain phosphoric acid and have been linked to poor bone health, likely because of the phosphorus causing calcium to be leeched from the skeleton. The Framingham Osteoporosis Study of more than 2,500 adults found that women who regularly drank cola daily had 3.7% lower bone mineral density at the hip than those who rarely drank them or drank other non-cola beverages.

Limit or eliminate processed foods. Phosphate additives are used as stabilizers, flavor enhancers, moisture binders, leavening and stabilizers in literally hundreds of processed foods, frozen foods, fast foods and packaged meats. In fact, there are more than 45 different phosphate-containing food additives on the market. You can find them listed under names like sodium phosphate, calcium phosphate and phosphoric acid. Limit processed and fast foods and read your labels to know how many phosphate containing food additives you're consuming.

Eat a moderate protein diet. Since phosphorus is most prevalent in high protein foods like meat, adhering to a healthy, moderate protein diet where 25% of your calories come from protein (as opposed to a high protein diet) may be a healthier choice to keep phosphorus levels within a healthy range.

What you don't store in your bones gets excreted through your urine. Most people fall within that normal range, but depending on your diet and certain health conditions such as diabetes, heavy alcohol intake, and/or eating disorders, phosphorus deficiency or excess can occur—both of which can have serious health consequences. Even within the normal range, having higher amounts of phosphorus also can pose some health risks, particularly heart disease.

Emerging research also shows that your genotype may influence your serum phosphorus levels. One large-scale study of more than 16,000 men and women found that variations in these key genes had a significant impact on your serum phosphorus levels.

Our analysis investigated which genotype for these genes was present in your DNA. Your rating of BELOW AVERAGE, NORMAL or ABOVE AVERAGE reflects whether your genotype included those alleles that carry a risk of having having low or high levels of this essential mineral or whether you were likely to have adequate levels.

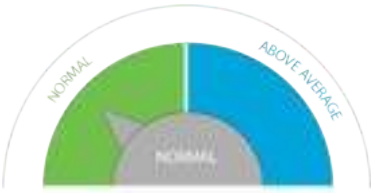
PHOSPHORUS-RICH FOODS TO INCLUDE IN YOUR DIET:

Seeds, cheese, fish, shellfish, nuts, pork, beef and veal, low fat dairy

SELENIUM TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that gi e you NORMAL blood selenium levels. That means that, like the majority of Americans, you likely have an adequate, healthy intake of this essential mineral. That's good news because selenium is necessary for strong immunity, cellular function, reproductive health and thyroid hormone production.



Your genetic profile indicates that you are likely to have NORMAL blood levels of selenium.

You can maintain healthy, adequate levels of this essential mineral by eating a diet rich in whole, unrefined foods.

SUCCESS STRATEGIES

According to the National Health and Nutrition Examination Survey (NHANES), the average daily selenium intake among Americans is 108.5 mcg. So most of us get more than enough and supplements aren't recommended.

Eating a diet high in refined foods can level you with lower than average selenium levels, because selenium is destroyed in processing. So be sure to fill our plate with whole foods whenever possible. Rich sources of selenium include fish, shellfish and seafood like tuna, shrimp, sardines, salmon, mushrooms, asparagus, poultry, tofu, eggs, grains, sunflower seeds, spinach, cabbage, milk and Brazil nuts (which you should only eat occasionally because they're extremely high in selenium).

RELATED GENES / SNPs

DMGDH

The gene and its associated SNPs that are included in this category have been shown to have significant associations with a person's blood levels of selenium.

Selenium is an essential mineral that plays multiple roles in maintaining good health. It works as an antioxidant with other nutrients such as vitamin E in the body to fend off free radical damage; it is vital to immune system function, male fertility and sperm health, and thyroid hormone metabolism.

Low levels of selenium have been shown to increase your risk for auto-immune disorders such as thyroid disease and psoriasis, infections and maybe even certain cancers.

Selenium is found across the dietary spectrum from seafood and meat to grains (and grain-based foods) and nuts, seeds and leafy greens. Adults need about 55 micrograms of the mineral a day and

MINERALS

SELENIUM TENDENCY

SELENIUM-RICH FOODS TO INCLUDE IN YOUR DIET:

Brazil nuts, yellowfin tuna, halibut, sardines, grass-fed beef, turkey, beef liver

most Americans get enough through a balanced diet. Selenium is found in the soil. So how much you get from your food depends on the mineral content of the soil in which the plants you, and the animals you eat, are grown. Selenium is destroyed in food processing, so eating a diet high in refined foods can put you at risk for lower selenium levels. Blood selenium levels also are influenced by genetic factors.

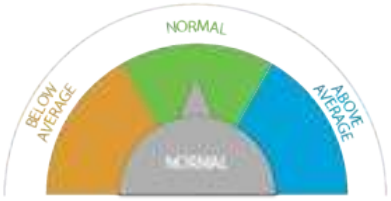
In one widespread analysis of more than 12,000 adults, genetic variations accounted for four percent of variation in blood selenium levels with minor alleles at this SNP increasing the average blood levels. That's a small percentage, but can be significant when considering a trace mineral. It's also possible to have too much of a good thing. Selenium is toxic in very high doses, which can cause GI distress, fatigue, hair loss and fingernail discoloration

Our analysis investigated which genotype for this gene was present in your DNA. Your rating of NORMAL or ABOVE AVERAGE reflects the selenium levels that are likely to be present in your blood.

ZINC TENDENCY

WHAT YOUR GENES SAY ABOUT YOU:

Our analysis indicates that your genetic profile exhibits characteristics that give you the likelihood of having NORMAL blood zinc levels. That's good news because adequate levels of zinc help keep your immunity strong and can help protect you from both acute diseases like colds and infections as well as chronic conditions like heart disease and diabetes. Remember that genetics play just one role in your blood level zinc status and its still important to get enough of this essential mineral in your daily diet, especially if you're among the groups, like older adults and vegetarians, who may have a tendency to have a lower than adequate daily zinc intake.



Your genetic profile indicates that you are likely to have NORMAL blood levels of zinc.

We recommend eating a diet rich in foods that are good sources of this essential mineral to continue getting the minimum 8 to 11 mg of zinc you need each day to maintain the zinc blood levels you need for strong immunity and healthy cellular function.

SUCCESS STRATEGIES

Since our bodies don't store zinc, we need to eat adequate amounts in our diet every day. Most Americans do. However, a sizeable percentage of the population falls short. National nutritional surveys show that up to 45 percent of adults over the age of 60 fall below the recommended amount. Vegetarians and vegans are also at risk for marginal amounts because zinc found in plant foods is harder for the body to absorb. In fact, some experts recommend that vegetarians aim to get 50% more zinc than the recommended dietary allowance to ensure their body gets the amounts it needs.

For meat eaters, getting adequate amounts of zinc is easy, especially if you also like shellfish. Just th ee ounces of oysters delivers 74 mg, far and away more than any other food source. Other zinc-rich foods include lobster, crab,

RELATED GENES / SNPs

CA1, PPCDC, LINC01420

The genes and their associated SNPs that are included in this category have all been shown to have significant associations with a person's blood levels of zinc.

Zinc is an essential trace element that plays a key role in immune function, protein synthesis, wound healing, insulin function, reproduction, thyroid function, blood clotting, growth, taste, vision and smell. After iron, it's the most common mineral in the body and is found in every cell.

You don't need much zinc to perform all these functions. The recommended dietary allowance for adults is just 8 mg (women) to 11 mg (men). But you do need zinc in your daily diet because the body doesn't store it.

Zinc deficiency hinders immune

ZINC TENDENCY

pork and chicken (dark meat especially). Zinc is also found in yogurt, baked beans, cashews, oatmeal, milk, kidney beans, almonds, chickpeas and fortified

If you eat little or no meat, consider taking a multivitamin as a form of insurance for days when your diet may fall short. Getting zinc in a multivitamin is preferable to taking it alone, as too much zinc on its own can cause copper levels to drop. Multivitamins contain the right balance of both.

ZINC-RICH FOODS TO INCLUDE IN YOUR DIET:

Lamb, pumpkin seeds, chickpeas, cashews, mushrooms, spinach, yogurt

function and has been associated with cardiovascular disease and diabetes. Though outright deficiency is uncommon in industrialized countries like America, there is evidence that relative zinc deficiency and marginal zinc levels may be somewhat common among certain populations, particularly among older people as well as vegetarians, since red meat and poultry provide the majority of zinc in the American diet and zinc from plant sources is slightly harder for the body to absorb. Taking too much zinc, which can happen when people supplement the mineral—a popular practice for staving off cold infections—can cause toxicity. Upper limits for intake are 34 mg for women and 40 mg for men.

Genetics can influence a person's zinc blood levels. In one widespread analysis of more than 12,000 adults, genetic variations accounted for 8 percent of the variation in blood zinc levels. Our analysis investigated which genotype for these genes was present in your DNA. Your rating of BELOW AVERAGE, NORMAL or ABOVE AVERAGE reflects the zinc levels that are likely to be present in your blood.

LINKS TO RELATED STUDIES:

VITAMINS - VITAMIN A TENDENCY

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Two common single nucleotide polymorphisms in the gene encoding beta-carotene 15,15'-monoxygenase alter beta-carotene metabolism in female volunteers

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VITAMINS - VITAMIN B6 TENDENCY

Am J Hum Genet. 2009 Apr;84(4):477-82. doi: 10.1016/j.ajhg.2009.02.011. Epub 2009 Mar 19. Erratum in: Am J Hum Genet. 2009 May;84(5):712. PMID: 19303062; PMCID: PMC2667971.

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PLoS One. 2013 May 16;8(5):e64343. doi: 10.1371/journal.pone.0064343. PMID: 23696881; PMCID: PMC3655956.

Imputation of variants from the 1000 Genomes Project modestly improves known associations and can identify low-frequency variant-phenotype associations undetected by HapMap based imputation

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MTHFR 677TT genotype and disease risk: is there a modulating role for B-vitamins?

https://pubmed.ncbi.nlm.nih.gov/24131523

Reilly R, McNulty H, Pentieva K, Strain JJ, Ward M.

Am J Clin Nutr. 2018 Dec 1;108(6):1334-1341. doi: 10.1093/ajcn/nqy209. PMID: 30339177; PMCID: PMC6290363.

The 677C□T variant of MTHFR is the major genetic modifier of biomarkers of folate status in a young, healthy Irish population

https://pubmed.ncbi.nlm.nih.gov/30339177

Shane B, Pangilinan F, Mills JL, et al.

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VITAMINS - VITAMIN B12 TENDENCY

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