Fertility Health Report

Welcome to the future of health and human potential

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TEST METHODOLOGY AND LIMITATIONS

This report is intended for informational purposes only and must be reviewed and explained by a qualified healthcare practitioner. It is not designed to provide a medical diagnosis, nor should it be interpreted independently by patients. Nutrigenomic insights can offer supportive guidance, but they should always be considered alongside clinical evaluation, medical history, and other diagnostic information. In sensitive areas such as fertility, where multiple complex factors influence outcomes, the recommendations provided should be viewed as educational and supportive rather than definitive. Patients are strongly encouraged to discuss all results and recommendations with their healthcare provider before making any changes to their diet, supplements, or lifestyle.

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My Health Report

My Comprehensive Results

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My High Priorities

This is a summary of your entire report, highlighting only your highest impact results broken out by report section. Use this section to quickly identify your top priorities, understand what genes and genotypes are involved in each of our reports, and get context on how these genes impact your fertility.

Sperm Count

OMEGA-3 FATTY ACIDS

FADS2: GG

The FADS2 gene encodes for converting plant-based omega-3 fatty acid alpha-linolenic acid (ALA) to EPA. Omega-3 fats are considered to be the most critical component in sperm membranes because of their contribution to sperm motility, membrane fluidity, and the fertile potential of sperm.

ACTION PLAN

- Your FADS2 genotype combination is associated with a higher requirement of EPA and DHA
- Omega-3 fatty acids increase total sperm count
- Omega-3 fatty acids act to reduce the risk of asthenozoospermia, improving normal sperm morphology, increasing total sperm count, concentration, motility, and volume, and reducing sperm DNA fragmentation
- Lower ratios of omega-6 to omega-3 and saturated to unsaturated fatty acids are associated with better semen parameters, including sperm count
- A randomized clinical trial of 238 infertile men given 1.84 grams of EPA and DHA per day or a placebo for 32 weeks found a significant improvement in total sperm count and sperm cell density in the omega-3 group

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FASTING INSULIN

9p21: CC

The homozygous 9p21 rs1333049 SNP has been shown to increase fasting insulin levels by 40% in those following a low-fiber diet compared to a high-fiber diet, whereas this was not seen in those without the risk allele. Male infertility cases have been found to have significantly higher levels of insulin and HOMA-IR, which affects sperm count.

ACTION PLAN

- You have the homozygous CC 9p21 genotype, associated with a 40% higher fasting insulin level when following a low fiber diet
- The foods used in the study for a high fiber diet include fruit, vegetables, nuts, lentils, beans, and whole grains

- We recommend that you get 38 grams of fiber from fruit, vegetables, nuts, lentils, beans, and whole grains,and test fasting insulin and HOMA-IR with your doctor

Sperm Concentration

CHOLINE

PEMT: CC

The PEMT gene controls the production of choline in the liver. Choline is a crucial factor in the regulation of sperm membrane structure and fluidity, and this nutrient plays an essential role in the maturation and fertilizing capacity of spermatozoa. The PEMT rs12325817 GG genotype was associated with a higher sperm concentration than the PEMT CG and CC genotypes.

ACTION PLAN

- You have the CC genotype that is associated with a lower sperm concentration compared to the GG genotype
- We recommend that you get at least 550mg of choline per day from liver, pastured eggs, beef round, beef heart, chicken, and wild cod

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Sperm Motility

OMEGA-3 FATTY ACIDS

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ACTION PLAN

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- Omega-3 fatty acids act to reduce the risk of poor sperm motility

- Lower ratios of omega-6 to omega-3 and saturated to unsaturated fatty acids are associated with better semen parameters, including motility
- A double-blind placebo found that supplementation of 0.5–2 g/day of DHA presented a considerable enhancement in sperm motility and minor improvements in oxidative stress in infertile men

FASTING INSULIN

9p21: CC

LESS RISK SLIGHT RISK HIGH RISK

The homozygous 9p21 rs1333049 SNP is associated with increased fasting insulin levels by 40% in those following a low-fiber diet compared to a high-fiber diet, whereas this was not seen in those without the risk genotype. Male infertility cases have shown significantly higher levels of insulin and HOMA-IR with reduced sperm motility.

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Sperm Morphology

OMEGA-3 FATTY ACIDS

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ACTION PLAN

- Your FADS2 genotype combination is associated with a higher requirement of EPA and DHA
- Omega-3 fatty acids improve sperm morphology and reduce sperm DNA fragmentation
- Lower ratios of omega-6 to omega-3 and saturated to unsaturated fatty acids are associated with better semen parameters, including sperm morphology
- A randomized, double-blind study of men undergoing evaluation for infertility who were given 1,500 mg per day of DHA enriched oil over a 10-week period resulted in improvement in DHA and omega-3 fatty

acid content in seminal plasma and a reduction in the percentage of spermatozoa with DNA damage

- We recommend 3,000mg total of EPA and DHA, with a target of 1500mg of DHA per day to improve sperm parameters

Oxidative Stress

GLUTATHIONE

GSTM1: AA

LESS RISK SLIGHT RISK HIGH RISK

Glutathione S-transferase (GSTM1) belongs to a family of detoxification enzymes and deficiency in enzyme activity is due to a deletion of the GSTM1 gene. Several studies reveal a possible correlation between male infertility and GSTM1 polymorphisms.

ACTION PLAN

- You have the deletion in GSTM1
- Those with the GSTM1 deletion should take extra precaution to avoid Bisphenol-A and phthalates, and increase alpha lipoic acid, selenium, glycine, cysteine, vitamin C, and cruciferous vegetables

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Sleep Support

SLEEP QUALITY

VDR FokI: GG

LESS RISK SLIGHT RISK HIGH RISK

VDR is present in the testicular Leydig cells, epididymis, prostate, seminal vesicles, and sperm, suggesting a need for vitamin D in such tissues for spermatogenesis and sperm maturation. Vitamin D increases intracellular calcium concentration in human spermatozoa through VDR and improves sperm motility. The VDR FokI rs2228570 gene is associated with male infertility and sleep quality.

ACTION PLAN

- You have the homozygous VDR FokI GG genotype that is more common in men experiencing infertility
- The VDR FokI GG genotype is associated with poor sleep quality, lower sperm count, motility, and sperm morphology

- Compared to men with night sleep duration of 7.5 to 8 hours a night, men who slept less than 6 hours had lower total sperm count, total motility, and progressive motility
- In a systematic review and meta-analysis of 9,397 participants, individuals with vitamin D deficiency had a significantly increased chance for sleep disturbances, poor sleep quality, and short sleep duration
- Vitamin D synthesizes serotonin and melatonin and lowers IL6
- The GG genotype may decrease the sensitivity to vitamin D and its effects on serotonin and melatonin synthesis, which can result in serotoninergic overactivity during the day and melatoninergic hypoactivity at night
- We recommend you test your vitamin D levels and supplement appropriately, include vitamin D co-factors including vitamin A, K2, magnesium, calcium, boron, and zinc, and optimize your sleep hygiene

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Your Personalized DNA-Based Grocery List

This section of the report represents the most expansive, actionable summary of what you can do, right now, to dramatically up-regulate gene function, building a happier, healthier you! No technical expertise is required - just make these recommendations non-negotiable when you visit the grocery store.

Your grocery list is generated based on a combination of unique gene variants that require an increased intake of the following vitamins, minerals, phytonutrients, amino acids, fiber and more. This list generates the foods and drinks based on the highest levels for each section and does not take into account any food allergies or sensitivities.

	B6	Wild salmon, yellowfin tuna, liver, chicken breast, unfiltered fermented drinks, pistachios, avocado, sweet potatoes, and spinach
	Choline	Pastured eggs, beef round, liver, heart, chicken, wild cod, bacon, and edamame
	Fiber	Oats, quinoa, brown rice, beans, lentils, berries, apples, pears, broccoli, Brussels sprouts, kale, nuts and seeds
	Glucosinolates	Brussels sprouts, mustard greens, turnips, savoy cabbage, kale, watercress, red cabbage, broccoli cauliflower, and Bok Choy
	Magnesium	Sprouted pumpkin seeds, hemp seeds, chia seeds, Gerolsteiner mineral water, spinach, wild salmon, and peanut butter
	Manganese	Mussels, wild blueberries, hazelnuts, pecans, oysters, clams, hummus, spinach, and cultivated blueberries

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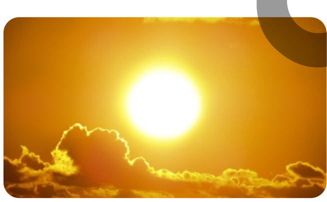
	Omega-3's	Seafood and pastured eggs
	Prebiotics	Pistachios, leeks, asparagus, radicchio, bananas, garlic, kiwi, onions, artichokes, Tiger nuts, chicory root, yacon syrup and foods high in polyphenols
	Probiotics	Fermented drinks like Kombucha, fermented veggies like sauerkraut, yogurt and kefir
	Vitamin A	Liver, pastured eggs, cod liver oil, wild salmon oil, eel, and sockeye salmon
	Vitamin D	Sockeye salmon, cod liver oil, canned tuna, wild herring, and sardines

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My Top Supplements

These are your highest priority supplement and dietary recommendations summarized from your entire fertility health report.

Fertility Recommendations

Alpha Lipoic Acid

Dose: 600mg daily

Notes: We recommend discussing the use and dosing of Alpha Lipoic Acid witih your health care practitioner.

Choline

Dose: 550mg daily

Notes: The highest absorption rate is from dietary choline, and this should be calculated for the total daily intake if adding in supplementation.

Fiber

Dose: 38 grams daily

Notes: We recommend that you test IR-HOMA.

Omega-3 Fatty Acids

Dose: 1,500-3,000mg daily

Notes: None.

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Personalized Blood Work

These results are generated based on a combination of gene variants unique to you. These biomarkers may not be out of range based on your diet and lifestyle habits, but they may be the ones for you to monitor to ensure you are making the right choices based on your genetic results (your predispositions).

For example, if vitamin D comes up in this section, it does not mean that your current levels of vitamin D are actually low. What we are saying is that based on a variety of genetic factors, your variants could make it more difficult to obtain recommended levels of circulating vitamin D, so it might be prudent to further monitor to ensure that you are taking the necessary steps to turn genetic weaknesses into strengths and maintain correct levels.

Fasting Insulin and HOMA-IR

Test fasting insulin and HOMA-IR.

Homocysteine

Test homocysteine with an ideal level between 7-9 (μmol/L).

Omega-3 and Omega-6 Fatty Acids

Test your omega-3 fatty acid levels as well as the ratio of omega-3 to omega-6.

Vitamin D

Vitamin D should be between 35-50 ng/ml. Check both 25 and 1,25-dihydroxyvitamin D.

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Sperm Count

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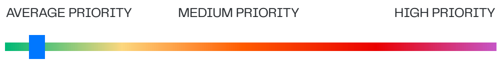
Sperm Count

B1 (Thiamine)

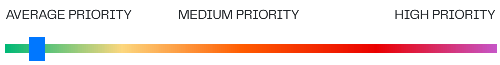


Variants in the TCF7L2 gene strongly predict future type 2 diabetes and are associated with increased pancreatic-cell TCF7L2 expression, decreased insulin secretion, and increased proinsulin:insulin ratio. Thiamine is essential for glucose oxidation, insulin production by pancreatic beta-cells, and cell growth.

- You have the wild-type CC TCF7L2 genotype, improving pancreatic beta-cell function
- Causes of thiamine deficiency include a refined grain-based diet, high alcohol intake, gastrointestinal disorders, and prolonged cooking of foods

Sperm Count

Folate

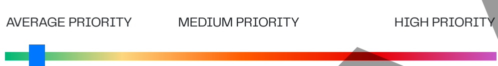


The MTHFR 677 gene encodes the MTHFR gene to convert folate into the active form, methylfolate. Low serum and seminal folate levels can result in high homocysteine levels, which may induce oxidative stress, sperm DNA damage, and apoptosis, lowering sperm counts.

- You have the wild-type GG MTHFR 677 that is associated with an average need for folate
- Folate supplementation has been positively associated with higher sperm density, overall higher semen quality, and is negatively associated with infertility

Sperm Count

B12



The FUT2 gene is responsible for vitamin B12 homeostasis and transport throughout the body. Variation in the FUT2 gene is associated with differing levels of circulating vitamin B12. The GG variant of FUT2 (rs602662) is linked to lower plasma vitamin B12 and has been observed in about 50% of the population.

- You have the homozygous AA FUT2 genotype that is associated with high B12 levels

Sperm Count

Zinc

The PPCDC gene is associated with serum zinc levels in the blood. Zinc deficiency causes a low quality of sperm, low testosterone, and male infertility.

- You have the wild-type TT PPCDC genotype associated with normal serum zinc levels
- The World Health Organization estimates that one-third of the world population has a zinc deficiency
- ACE inhibitors, antibiotics, diuretics, hormone replacement therapy, MAO inhibitors, oral contraceptives, and proton pump inhibitors deplete zinc
- High seminal zinc concentrations, however, have a suppressing effect on progressive motility of the spermatozoa ("quality of movement"), not on percentage of motile spermatozoa ("quantity of movement")

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Sperm Count

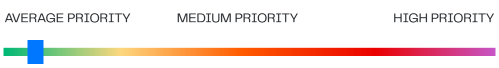
Vitamin A

Vitamin A plays a vital role in male reproductive health. Vitamin A circulates in two main forms in the body: beta-carotene (inactivated) and retinol (activated). The BCMO1 gene encodes the conversion rate from beta-carotene to vitamin A.

- Your BCMO1 genotype combination is associated with a 32% lower conversion rate of beta-carotene to vitamin A, making it important to include more animal-based vitamin A to hit your daily target
- Higher serum retinol has been observed in men with normal sperm compared to those with low sperm count and azoospermia (no sperm present)
- Vitamin A deficiency damages the seminiferous epithelium of the epididymis, prostate, and the seminal vesicle, which results in the termination of spermatogenesis
- Despite vitamin A deficiency leading to early cessation of spermatogenesis, one study found that long-term chronic excessive intake of vitamin A impairs sperm production, morphology, motility and viability in mice
- We recommend 900mcg to 3,000mcg as retinol daily

Sperm Count

Vitamin C



Polymorphisms in SLC23A1 are associated with reduced plasma vitamin C levels in the body. Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations.

- You have the wild-type CC SL23A1 gene that is associated with normal serum vitamin C levels
- Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations

Sperm Count

Omega-3 Fatty Acids

The FADS2 gene encodes for converting plant-based omega-3 fatty acid alpha-linolenic acid (ALA) to EPA. Omega-3 fats are considered to be the most critical component in sperm membranes because of their contribution to sperm motility, membrane fluidity, and the fertile potential of sperm.

- Your FADS2 genotype combination is associated with a higher requirement of EPA and DHA
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- Omega-3 fatty acids act to reduce the risk of asthenozoospermia, improving normal sperm morphology, increasing total sperm count, concentration, motility, and volume, and reducing sperm DNA fragmentation
- Lower ratios of omega-6 to omega-3 and saturated to unsaturated fatty acids are associated with better semen parameters, including sperm count
- A randomized clinical trial of 238 infertile men given 1.84 grams of EPA and DHA per day or a placebo for 32 weeks found a significant improvement in total sperm count and sperm cell density in the omega-3 group

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Sperm Count

Lycopene

AVERAGE PRIORITY MEDIUM PRIORITY HIGH PRIORITY

Lycopene is an antioxidant carotenoid frequently found in tomatoes and several red fruits. This molecule is a modulator of lipid peroxidation and antioxidant enzyme activities and has a positive effect on testicular mitochondrial function and sperm quality. Those with SOD2 variants benefit from increased lycopene intake.

- You have the heterozygous AG SOD2 genotype, indicating a higher need for lycopene
- In a meta-analysis of non-pharmaceutical interventions on sperm total motility, the top two interventions were acupuncture and lycopene
- Lycopene supplementation in human and animal studies significantly improves sperm count and viability and alleviates male infertility-lipid peroxidation and DNA damage
- Improvement of sperm parameters indicates a reduction in oxidative stress, and thus the spermatozoa is less vulnerable to oxidative damage, which increases the chances of a normal sperm fertilizing the egg
- Human trials have reported improvement in sperm parameters and pregnancy rates with supplementation of 4-8 mg of lycopene daily for 3-12 months

Sperm Count

Fasting Insulin

AVERAGE PRIORITY MEDIUM PRIORITY HIGH PRIORITY

The homozygous 9p21 rs1333049 SNP has been shown to increase fasting insulin levels by 40% in those following a low-fiber diet compared to a high-fiber diet, whereas this was not seen in those without the risk allele. Male infertility cases have been found to have significantly higher levels of insulin and HOMA-IR, which affects sperm count.

- You have the homozygous CC 9p21 genotype, associated with a 40% higher fasting insulin level when following a low fiber diet
- The foods used in the study for a high fiber diet include fruit, vegetables, nuts, lentils, beans, and whole grains
- We recommend that you get 38 grams of fiber from fruit, vegetables, nuts, lentils, beans, and whole grains,and test fasting insulin and HOMA-IR with your doctor

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Sperm Concentration

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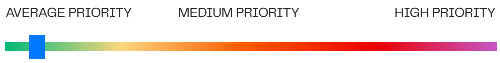
Sperm Concentration

Folate

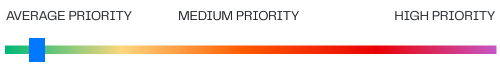


The MTHFR 677 gene encodes the MTHFR gene to convert folate into the active form, methylfolate. The ability of methylfolate to improve sperm concentration has been associated with the homozygous genotype in the MTHFR 677 gene.

- You have the wild-type GG MTHFR 677 that is associated with an average need for folate
- Folate supplementation has been positively associated with higher sperm density, overall higher semen quality, and is negatively associated with infertility

Sperm Concentration

B12

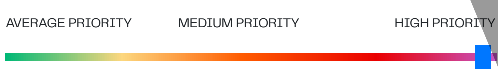


The FUT2 gene is responsible for vitamin B12 homeostasis and transport throughout the body. Variation in the FUT2 gene is associated with differing levels of circulating vitamin B12. The GG variant of FUT2 (rs602662) is linked to lower plasma vitamin B12 and has been observed in about 50% of the population.

- You have the homozygous AA FUT2 genotype that is associated with high B12 levels
- You may need to avoid high doses of supplemental B12

Sperm Concentration

Choline



The PEMT gene controls the production of choline in the liver. Choline is a crucial factor in the regulation of sperm membrane structure and fluidity, and this nutrient plays an essential role in the maturation and fertilizing capacity of spermatozoa. The PEMT rs12325817 GG genotype was associated with a higher sperm concentration than the PEMT CG and CC genotypes.

- You have the CC genotype that is associated with a lower sperm concentration compared to the GG genotype
- We recommend that you get at least 550mg of choline per day from liver, pastured eggs, beef round, beef heart, chicken, and wild cod

Sperm Concentration

Vitamin A

Vitamin A plays a vital role in male reproductive health. Vitamin A circulates in two main forms in the body: beta-carotene (inactivated) and retinol (activated). The BCMO1 gene encodes the conversion rate from beta-carotene to vitamin A.

- Your BCMO1 genotype combination is associated with a 32% lower conversion rate of beta-carotene to vitamin A, making it important to include more animal-based vitamin A to hit your daily target
- Retinoic acid, the vitamin A metabolite, may play a role in male fertility via its influence on the regulation of sperm morphology and concentration
- Vitamin A deficiency damages the seminiferous epithelium of the epididymis, prostate, and the seminal vesicle, which results in the termination of spermatogenesis
- Despite vitamin A deficiency leading to early cessation of spermatogenesis, one study found that long-term chronic excessive intake of vitamin A impairs sperm production, morphology, motility and viability in mice
- We recommend 900mcg to 3,000mcg as retinol daily

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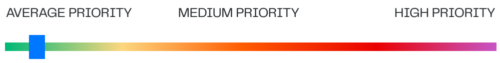
Sperm Concentration

Vitamin C

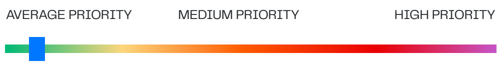


Polymorphisms in the gene are associated with reduced plasma vitamin C levels in the body. Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations.

- You have the wild-type CC SL23A1 gene that is associated with normal serum vitamin C levels
- Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations

Sperm Concentration

Vitamin E



Vitamin E status is affected by dietary vitamin E intake, absorption efficiency, and catabolism. Dietary vitamin E correlates with serum and seminal alpha-tocopherol levels, which are positively related to fertility and normal sperm parameters. The ability of a-tocopherol to affect IL-6 production is influenced by the GSTP1 rs1695 polymorphism.

- Your genotype for GSTP1 rs1695 is not associated with a higher requirement for alpha-tocopherol to increase antioxidant capacity and lower IL6
- People with the wild-type AA or heterozygous AG genotype in GSTP1 rs1695 should not supplement over 75 IU of alpha-tocopherol

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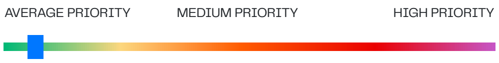
Sperm Motility

SAMPLE

Sperm Motility

Betaine



Circulating betaine concentration depends on both folate and choline metabolism and betaine status can be impacted by polymorphisms through two pathways: choline dehydrogenase (CHDH) and phosphatidylethanolamine N-methyltransferase (PEMT). Variants in the choline metabolizing gene choline dehydrogenase (CHDH) are associated with greater risk for infertility.

- You have the CC genotype for CHDH that is associated with higher ATP concentrations and improved sperm motility

Sperm Motility

Vitamin B6

The NBPF3 gene is associated with serum vitamin B6 levels. Research has shown that men with reduced sperm motility have lower seminal plasma vitamin B6 levels compared to men with normal sperm motility.

- You have the heterozygous CT NBPF3 genotype, associated with lower serum vitamin B6 levels
- Heterozygotes have a 1.45 ng/mL lower Vitamin B6 blood concentration than the wild-type genotype
- A diet high in lean protein intake increases the need for B6
- Discuss with your doctor if you are taking any medications that deplete B6
- Vitamin B6 deficiency may trigger chemical toxicity to sperm, including hyperhomocysteinemia and oxidative injury
- We recommend 2mg to 5mg of B6 as pyridoxal-5-phosphate daily

Sperm Motility

B12

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- You have the homozygous AA FUT2 genotype that is associated with high B12 levels

Sperm Motility

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- A double-blind placebo found that supplementation of 0.5-2 g/day of DHA presented a considerable enhancement in sperm motility and minor improvements in oxidative stress in infertile men

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Sperm Motility

Vitamin A

AVERAGE PRIORITY MEDIUM PRIORITY HIGH PRIORITY

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- Your BCMO1 genotype combination is associated with a 32% lower conversion rate of beta-carotene to vitamin A, making it important to include more animal-based vitamin A to hit your daily target
- Higher serum retinol has been observed in men with normal sperm compared to those with reduced sperm motility
- Vitamin A deficiency damages the seminiferous epithelium of the epididymis, prostate, and the seminal vesicle, which results in the termination of spermatogenesis
- Despite vitamin A deficiency leading to early cessation of spermatogenesis, one study found that long-term chronic excessive intake of vitamin A impairs sperm production, morphology, motility and viability in mice
- We recommend 900mcg to 3,000mcg as retinol daily

Sperm Motility

Vitamin C

AVERAGE PRIORITY MEDIUM PRIORITY HIGH PRIORITY

Polymorphisms in the gene are associated with reduced plasma vitamin C levels in the body. Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations.

- You have the wild-type CC SL23A1 gene that is associated with normal serum vitamin C levels
- Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations

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Sperm Motility

Vitamin D

To exert its biological functions, dietary and endogenous vitamin D must be activated to 1,25-hydroxyvitamin D by the enzyme vitamin D 25-hydroxylase, which is regulated partly by the CYP2R1 gene. Activated vitamin D is transported throughout the body by the vitamin D binding protein (DBP), which is encoded by the GC gene.

- Your genotype combination of CYP2R1 and GC is associated with lower circulating vitamin D
- Vitamin D modulates cholesterol and triglycerides in sperm head membranes, which are essential for the protection of sperm DNA and may potentially have an impact on sperm viability, motility, and fertilization capacity
- Vitamin D's role in maintaining calcium homeostasis may also contribute both to motility and to the acrosome reaction, which potentiates fertilization
- 1,25-dihydroxyvitamin D concentration may potentially have a stronger association with sperm parameters in comparison to circulating 25-hydroxyvitamin D
- Human studies analyzing circulating vitamin D and semen parameters are less common than rodent models, but some have shown that serum 25-hydroxyvitamin D concentrations correlate positively with sperm motility as well as circulating testosterone levels
- There appears to be a U-shaped relationship between serum vitamin D and androgen concentrations, where both deficiency and excess may be associated with adverse reproductive outcomes
- In a randomized clinical trial investigating the effects of dietary supplementation on sperm motility in men with idiopathic poor sperm motility, results found that after 3 months, the calcium/vitamin D group achieved pregnancy in 16.3% of cases, compared to 2.3% in the vitamin E/vitamin C group
- We recommend that you test your vitamin D levels and supplement based on your practitioner's recommendation to achieve optimal levels

Sperm Motility

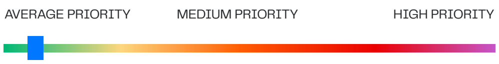
Vitamin E

Vitamin E status is affected by dietary vitamin E intake, absorption efficiency, and catabolism. Dietary vitamin E correlates with serum and seminal alpha-tocopherol levels, which are positively related to fertility and normal sperm parameters. The ability of a-tocopherol to affect IL-6 production is influenced by the GSTP1 rs1695 polymorphism.

- Your genotype for GSTP1 rs1695 is not associated with a higher requirement for alpha-tocopherol to increase antioxidant capacity and lower IL6
- As an antioxidant and protector of sperm membrane lipids, vitamin E is important in promoting motility and proper morphology of sperm, as well as fertilization within the acrosome reaction
- People with the wild-type AA or heterozygous AG genotype in GSTP1 rs1695 should not supplement over 75 IU of alpha-tocopherol

Sperm Motility

Calcium



The GGCX gene is involved in calcium regulation through its role in the carboxylation of proteins and is dependent on vitamin K2. The GGCX rs699664 SNP has a significant association with reduced sperm motility and infertility.

- Your genotype for GGCX is not associated with poor sperm motility related to calcium
- Calcium has a positive effect on sperm maturation, motility, morphology, and overall function

SAMPLE

Sperm Motility

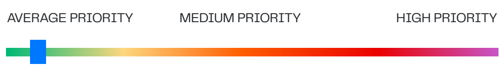
Vitamin K2

Variants in VOKRC1*2 may increase the need for vitamin K2 and sensitivity to the depletion of vitamin K from Warfarin.

- You have the heterozygous CT genotype for VOKRC1*2 that is associated with increased vitamin K2 requirements and a sensitivity to the depletion of vitamin K from Warfarin
- A lifelong decreased activity of the VKORC1 enzyme may increase the risk of vascular calcification that can affect fertility and could be further worsened by a reduced intake of vitamin K2
- Vitamin K2 is essential for epididymal sperm maturation, motility, and male fertility
- Researchers found that Warfarin works as a male contraceptive by depleting vitamin K and targeting GGCX-MGP, showing the importance of vitamin K2 for fertility
- We recommend 100mcg or more of vitamin K2 as MK-4 and MK-7

Sperm Motility

Magnesium



The GPX1 (Glutathione peroxidase 1) gene encodes a protein responsible for modulating and detoxifying hydroperoxides and hydrogen peroxide to protect the mitochondria and cytoplasm of cells against oxidative damage. Magnesium increases glutathione peroxidase activity and plays a role in spermatogenesis and sperm motility.

- You have the wild-type GG GPX1 genotype associated with regular activity and, therefore, may require an average intake of magnesium to maintain healthy GPX1 levels

Sperm Motility

Selenium

Research has shown that individual requirements for selenium will differ because of polymorphisms in seleno-protein genes. Selenium is a primary mineral needed for healthy GPX1 gene function and plays a significant role in male fertility.

- You have the wild-type GG GPX1 genotype that is associated with improved activity and an average selenium requirement

Sperm Motility

Fasting Insulin

The homozygous 9p21 rs1333049 SNP is associated with increased fasting insulin levels by 40% in those following a low-fiber diet compared to a high-fiber diet, whereas this was not seen in those without the risk genotype. Male infertility cases have shown significantly higher levels of insulin and HOMA-IR with reduced sperm motility.

- You have the homozygous CC 9p21 genotype, associated with a 40% higher fasting insulin level when following a low-fiber diet
- The foods used in the study for a high-fiber diet include fruit, vegetables, nuts, lentils, beans, and whole grains
- We recommend that you get 38 grams of fiber from fruit, vegetables, nuts, lentils, beans, and whole grains,and test fasting insulin and HOMA-IR with your doctor

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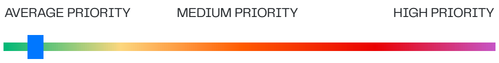
Sperm Morphology

SAMPLE

Sperm Morphology

Folate

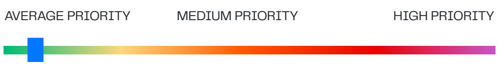


The MTHFR 677 gene encodes the MTHFR gene to convert folate into the active form, methylfolate. Low levels of serum and seminal folate can result in high levels of homocysteine, which may induce oxidative stress and sperm DNA damage.

- You have the wild-type GG MTHFR 677 that is associated with an average need for folate
- Folate supplementation has been positively associated with normal sperm morphology

Sperm Morphology

B12



The FUT2 gene is responsible for vitamin B12 homeostasis and transport throughout the body. Variation in the FUT2 gene is associated with differing levels of circulating vitamin B12. The GG variant of FUT2 (rs602662) is linked to lower plasma vitamin B12 and has been observed in about 50% of the population.

- You have the homozygous AA FUT2 genotype that is associated with high B12 levels
- You may need to avoid high doses of supplemental B12

Sperm Morphology

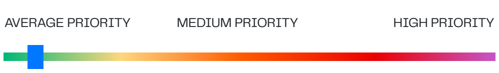
Vitamin A

Vitamin A plays a vital role in male reproductive health. Vitamin A circulates in two main forms in the body: beta-carotene (inactivated) and retinol (activated). The BCMO1 gene encodes the conversion rate from beta-carotene to vitamin A.

- Your BCMO1 genotype combination is associated with a 32% lower conversion rate of beta-carotene to vitamin A, making it important to include more animal-based vitamin A to hit your daily target
- Retinoic acid, the vitamin A metabolite, may play a role in male fertility via its influence on regulation of sperm morphology
- Vitamin A deficiency damages the seminiferous epithelium of the epididymis, prostate, and the seminal vesicle, which results in the termination of spermatogenesis
- Despite vitamin A deficiency leading to early cessation of spermatogenesis, one study found that long-term chronic excessive intake of vitamin A impairs sperm production, morphology, motility and viability in mice
- We recommend 900mcg to 3,000mcg as retinol daily

Sperm Morphology

Vitamin C



Polymorphisms in the gene are associated with reduced plasma vitamin C levels in the body. Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations.

- You have the wild-type CC SL23A1 gene that is associated with normal serum vitamin C levels
- Vitamin C intake has been positively associated with healthy semen parameters, as dietary intake influences seminal ascorbic acid concentrations

SAMPLE

Sperm Morphology

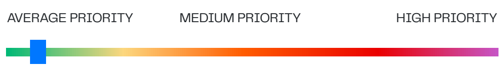
Vitamin D

To exert its biological functions, dietary and endogenous vitamin D must be activated to 1,25-hydroxyvitamin D by the enzyme vitamin D 25-hydroxylase, which is regulated partly by the CYP2R1 gene. Activated vitamin D is transported throughout the body by the vitamin D binding protein (DBP), which is encoded by the GC gene.

- Your genotype combination of CYP2R1 and GC is associated with lower circulating vitamin D
- 1,25-dihydroxyvitamin D concentration may potentially have a stronger association with sperm parameters in comparison to circulating 25-hydroxyvitamin D
- Human studies analyzing circulating vitamin D and semen parameters are less common than rodent models, but some have shown that serum 25-hydroxyvitamin D concentrations correlate positively with normal sperm morphology as well as circulating testosterone levels
- We recommend that you test your vitamin D levels and supplement based on your practitioner's recommendation to achieve optimal levels

Sperm Morphology

Vitamin E



Vitamin E status is affected by dietary vitamin E intake, absorption efficiency, and catabolism. Dietary vitamin E correlates with serum and seminal alpha-tocopherol levels, which are positively related to fertility and normal sperm parameters. The ability of a-tocopherol to affect IL-6 production is influenced by the GSTP1 rs1695 polymorphism.

- Your genotype for GSTP1 rs1695 is not associated with a higher requirement for alpha-tocopherol to increase antioxidant capacity and lower IL6
- As an antioxidant and protector of sperm membrane lipids, vitamin E is important in promoting motility and proper morphology of sperm, as well as fertilization within the acrosome reaction
- People with the wild-type AA or heterozygous AG genotype in GSTP1 rs1695 should not supplement over 75 IU of alpha-tocopherol

Sperm Morphology

Omega-3 Fatty Acids

The FADS2 gene encodes for converting plant-based omega-3 fatty acid alpha-linolenic acid (ALA) to EPA. Omega-3 fats are considered to be the most critical component in sperm membranes because of their contribution to sperm motility, membrane fluidity, and the fertile potential of sperm.

- Your FADS2 genotype combination is associated with a higher requirement of EPA and DHA
- Omega-3 fatty acids improve sperm morphology and reduce sperm DNA fragmentation
- Lower ratios of omega-6 to omega-3 and saturated to unsaturated fatty acids are associated with better semen parameters, including sperm morphology
- A randomized, double-blind study of men undergoing evaluation for infertility who were given 1,500 mg per day of DHA enriched oil over a 10-week period resulted in improvement in DHA and omega-3 fatty acid content in seminal plasma and a reduction in the percentage of spermatozoa with DNA damage
- We recommend 3,000mg total of EPA and DHA, with a target of 1500mg of DHA per day to improve sperm parameters

SAMPLE

Sperm Morphology

Testosterone

A combination of genetic variants in the SHBG gene has been associated with low, average, and above-average testosterone levels. Low testosterone has been associated with poor sperm morphology.

- Your genotype combination is associated with average baseline testosterone levels
- Testosterone peaks throughout puberty and continues to stay in optimal ranges until around 40 years old
- In male partners of infertile couples undergoing IVF, low testosterone was associated with poor sperm morphology, but not volume, concentration or motility
- In couples with a male partner with low testosterone, 18.8% had a live birth compared to 27.5% in couples with a male partner having a testosterone level greater than 264 ng/dL
- Magnesium, zinc, vitamin D, omega-3s, boron, fat intake, compound weight lifting, sprints, chopping wood, and eight hours of sleep per night have all been found to increase testosterone
- We recommend testing testosterone, with an optimal level being 550-900 ng/dl

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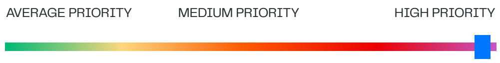
Oxidative Stress

SAMPLE

Oxidative Stress

Glutathione



Glutathione S-transferase (GSTM1) belongs to a family of detoxification enzymes and deficiency in enzyme activity is due to a deletion of the GSTM1 gene. Several studies reveal a possible correlation between male infertility and GSTM1 polymorphisms.

- You have the deletion in GSTM1
- Those with the GSTM1 deletion should take extra precaution to avoid Bisphenol-A and phthalates, and increase alpha lipoic acid, selenium, glycine, cysteine, vitamin C, and cruciferous vegetables

Oxidative Stress

Superoxide Dismutase

Superoxide dismutase (SOD2) is manganese-dependent and protects the cell's mitochondria against superoxide. Several studies suggest an association between the SOD2 Val16Ala variant (rs4880) and male infertility. Variants in SOD2 increase the need for manganese and intracellular antioxidant protection.

- You have the heterozygous genotype for SOD2 that is associated with reduced SOD2 activity and mitochondrial production
- SOD activity in semen is positively correlated with sperm concentration and motility
- Avoid vegetable oils, high-fat diets, and high amounts of refined carbohydrates
- Optimize manganese, CoQ10, vitamin A, C, E, and omega-3 fatty acid intake, and consider adding maitake, oyster, shiitake, and porcini mushrooms to your diet
- We recommend 2-5mg of manganese daily

Oxidative Stress

Catalase

The CAT enzyme, encoded by the CAT gene, plays a role in maintaining normal levels of ROS by converting H2O2 to H2O. Catalase plays a role in maintaining normal levels of ROS and protecting sperm from potentially toxic levels of ROS. Research has shown that catalase levels in infertile patients are significantly lower.

- You have the wild-type CC genotype for the CAT gene that is associated with improved catalase levels

Oxidative Stress

Glutathione Peroxidase

The GPX1 (Glutathione peroxidase 1) gene encodes a protein responsible for modulating and detoxifying hydroperoxides and hydrogen peroxide to protect the mitochondria and cytoplasm of cells against oxidative damage.

- You have the wild-type GG genotype for the GPX1 gene that is associated with improved glutathione peroxidase levels

SAMPLE

Oxidative Stress

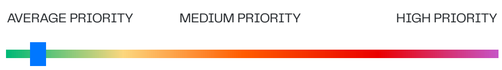
Lead

Heavy metal exposure has been conclusively linked with sperm oxidative damage. Both cadmium and lead increase testicular oxidative stress and a resultant increase in sperm DNA oxidation. The deletion in GSTM1 and variants in the GPX1 gene are associated with reduced protection against the oxidative stress of lead.

- Your genotype is associated with reduced detoxification and more toxic effects from elevated lead levels
- Lead may alter sperm quality in men
- The increase in infertility and miscarriage observed in the partners of welders and battery/paint factory workers may be due to oxidative damage to sperm DNA initiated by the inhalation of metal fumes
- Vitamin C lowers lead levels in the body while calcium blocks its uptake
- Avoid lead-containing cookware, check if your home has lead pipes, optimize iron levels, and get 1,000mg of calcium and 750mg of vitamin C daily to help block the update of lead and reduce blood lead levels

Oxidative Stress

Cadmium



Heavy metal exposure has been conclusively linked with sperm oxidative damage. Both cadmium and lead increase testicular oxidative stress and a resultant increase in sperm DNA oxidation. Variants in GSTP1 increase the sensitivity to the oxidative stress from cadmium.

- You have the wild-type CC genotype for GSTP1 that is associated with average detoxification of cadmium

Oxidative Stress

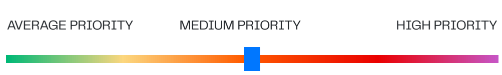
Pesticides

Paraoxonases (PON1) are a family of enzymes that break down chemicals, including several types of pesticides and pharmaceutical drugs. The rs662 SNP is the most clinically relevant for PON1. The C allele is also known as the “R” allele in research studies. A combination of PON1 and SOD2 variants have been found to increase the risk of male infertility.

- Your PON1 and SOD2 genotype combination that is associated with slightly decreased PON1 activity for pesticide detoxification
- Men working in agricultural regions and greenhouses that use pesticides have higher concentrations of common pesticides in their urine and a 60% decrease in sperm concentrations
- Avoid heavily sprayed fruits and vegetables, optimize calcium and magnesium intake, and consider adding black cumin seed oil, pomegranates, broccoli sprouts, high-quality olive oil, and a glass of organic red wine

Oxidative Stress

Glyphosate



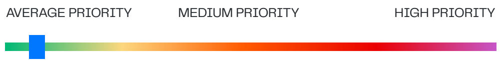
Researchers have postulated that chronic exposure to food containing glyphosate-based herbicides could be related to unexplained fertility issues. Glyphosate has been shown to decrease catalase and superoxide dismutase.

- Your genotype combination for SOD2 and CAT is associated with more cellular damage from exposure to the herbicide glyphosate
- In vitro research at high concentrations that greatly exceed environmental exposures shows that glyphosate exerts toxic effects on sperm progressive motility but not on sperm DNA integrity
- The highest glyphosate levels have been found in non-organic wheat and non-organic pulses like beans, lentils, and peas
- Avoid non-organic wheat, beans, lentils, peas, wine, and beer, and optimize vitamin E intake to protect against glyphosate-induced oxidative stress

SAMPLE

Oxidative Stress

Hemochromatosis



HFE C282Y is tested to determine hemochromatosis risk.

- You have the wild-type GG HFE C282Y genotype that is not associated with genetically linked hemochromatosis

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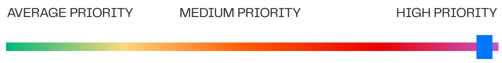
Sleep Support

SAMPLE

Sleep Support

Sleep Quality



VDR is present in the testicular Leydig cells, epididymis, prostate, seminal vesicles, and sperm, suggesting a need for vitamin D in such tissues for spermatogenesis and sperm maturation. Vitamin D increases intracellular calcium concentration in human spermatozoa through VDR and improves sperm motility. The VDR FokI rs2228570 gene is associated with male infertility and sleep quality.

- You have the homozygous VDR FokI GG genotype that is more common in men experiencing infertility
- The VDR FokI GG genotype is associated with poor sleep quality, lower sperm count, motility, and sperm morphology
- Compared to men with night sleep duration of 7.5 to 8 hours a night, men who slept less than 6 hours had lower total sperm count, total motility, and progressive motility
- In a systematic review and meta-analysis of 9,397 participants, individuals with vitamin D deficiency had a significantly increased chance for sleep disturbances, poor sleep quality, and short sleep duration
- Vitamin D synthesizes serotonin and melatonin and lowers IL6
- The GG genotype may decrease the sensitivity to vitamin D and its effects on serotonin and melatonin synthesis, which can result in serotoninergic overactivity during the day and melatoninergic hypoactivity at night
- We recommend you test your vitamin D levels and supplement appropriately, include vitamin D co-factors including vitamin A, K2, magnesium, calcium, boron, and zinc, and optimize your sleep hygiene

SAMPLE

Stress Management

SAMPLE

Stress Management

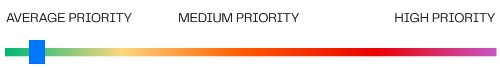
Pressure Response

COMT (catecholamine methyltransferase) is the gene for dopamine, estrogen, adrenaline and catecholamine metabolism. Studies have found that the A allele in COMT V158M (rs4680) results in a 40% decrease in COMT enzyme activity, leading to naturally higher dopamine and adrenaline levels.

- You have the heterozygous AG genotype for COMT that is associated with a decreased breakdown of dopamine levels and a reduced clearance of adrenaline in response to stress
- Men who experienced two or more stressful life events had a lower percentage of motile sperm and a lower percentage of morphologically normal sperm
- Weight lifting helps speed up the pathway responsible for clearing excess dopamine and adrenaline, and therefore is a useful tool for you to use for chronic stress
- We recommend weight lifting 3x a week, 400-500mg of magnesium daily, and minimizing catecholamine intake (coffee, green tea, chocolate, red wine)

Stress Management

BDNF



BDNF (brain-derived neurotrophic factor) has a protective effect on sperm oxidative stress, which can maintain sperm activity. Variants in the BDNF gene affect baseline BDNF levels.

- You have the wild-type CC genotype for BDNF that is associated with higher baseline BDNF levels

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Infertility affects 20-30% of women of reproductive age globally, with 50% ascribed to men due to defects in sperm quantity, quality, or motility.[1] Research is now showing that nutritional patterns, body weight, oxidative stress, psychological and emotional stress, and inflammation play a monumental role in a high percentage of both female and male infertility cases.

In a meta-analysis of 223 studies across 53 countries, nearly 50 years of data on sperm count and concentration rates were analyzed from 1973 to 2018. The latest findings show a rapid global decline in sperm concentration across North America, Europe, Australia, South and Central America, Asia, and Africa.[2] Even more alarming is that the researchers found that the rate of sperm concentration loss has been accelerating and doubled yearly starting after the year 2000.

Dietary factors and environmental exposures can impair spermatogenesis, reduce sperm concentration and motility, and increase sperm DNA damage. Exposure to pesticides, herbicides, heavy metals, phthalates, and BPA plastic is hypothesized to be a leading cause of the global decline in sperm count and concentration, poor motility, and morphology.

Dietary patterns for men that are high in sugar, processed red meat, refined carbohydrates, saturated fatty acids, and alternative sweeteners, and low in omega-3 fatty acids, monounsaturated fatty acids, antioxidants, fruits, and vegetables have all been shown to drastically impact fertility due to elevated oxidative stress levels.[3,4]

During natural conception or routine IVF, oxidative damage to the sperm membrane can block fertilization, preventing the damaged paternal DNA from creating an embryo. The risk is even higher in obese men with diabetes, dyslipidemia, or metabolic syndrome.

Finally, men with poor semen quality are at a greater risk for testicular cancer, cardiovascular disease, and a reduced lifespan.[5] Screening for poor semen quality from genetic susceptibilities and other fertility testing may not only serve as advanced tools for increasing fertility rates, but also for optimizing men's health and longevity.

The myDNA Fertility Panel

The myDNA Fertility panel is the most comprehensive nutrigenomic genetic analysis on the market for men and women experiencing infertility, uncovering foundational causes of deficiency, toxicity, and inflammation. Separate genetic panels are available for men and women.

Men's Fertility

Sperm Count

- B1
- Folate
- B12
- Zinc
- Vitamin A
- Vitamin C
- Omega-3 Fatty Acids
- Lycopene
- Fasting Insulin

SAMPLE

Sperm Concentration

- Folate
- B12
- Choline
- Vitamin A
- Vitamin C
- Vitamin E

Sperm Motility

- Betaine
- B6
- B12
- Omega-3 Fatty Acids
- Vitamin A
- Vitamin C
- Vitamin D
- Vitamin E
- Calcium
- K2
- Magnesium
- Selenium
- Fasting Insulin

Sperm Morphology

- Folate
- B12
- Vitamin A
- Vitamin C
- Vitamin D
- Vitamin E
- Omega-3 Fatty Acids
- Testosterone

Oxidative Stress

- Glutathione
- Catalase
- Superoxide Dismutase
- Glutathione Peroxidase
- Lead
- Cadmium
- Pesticides
- Glyphosate
- Hemochromatosis

Sleep

- Sleep Quality

Stress

- Pressure Response

SAMPLE

- BDNF

Clinical Application: The MTHFR Gene

The MTHFR 677 gene produces the MTHFR enzyme that converts methylfolate to 5-MTHF and helps regulate homocysteine levels, with variants in these genes increasing the need for folate to regulate homocysteine levels. Optimizing the methylation genes and homocysteine levels through folate, B6, and B12 has been shown to reduce miscarriages and improve pregnancy outcomes in IVF.[6]

Variants in MTHFR 677 are most common in those with Mediterranean and Southeast Asian ancestry. A diet reflecting these environments with a foundation of fish, legumes, and vegetables was linearly related to red blood cell folate and vitamin B6 in blood and follicular fluid, with a 40% increase in the chance of pregnancy by IVF.[7]

While synthetic folic acid is the general prenatal supplement recommendation, research on the MTHFR polymorphisms has shown multiple potential downsides of using folic acid instead of methylfolate or folinic acid.

In one study, six Australian practitioners submitted case information for twelve patients with diagnosed infertility and MTHFR polymorphisms. All patients had been advised by their practitioner to remove folic acid in supplemental form and were prescribed 5-methyltetrahydrofolate (5-MTHF) or a combination of 5-MTHF and folinic acid. The dosage was higher than the Australian recommended dose (mean daily maximum prescribed dose 2325μg). Eleven patients conceived within two to four months upon commencement of non-folic acid forms of folate, and ten were reported as having a live birth.[8]

For men, low serum and seminal folate levels can result in high homocysteine levels, which may induce oxidative stress, sperm DNA damage, and apoptosis, lowering sperm counts. Folate supplementation has been positively associated with lower sperm injury, higher sperm density, normal sperm morphology, and overall higher semen quality, and negatively associated with infertility.[9]

Clinical Application: The CHDH Gene

Circulating betaine concentration depends on folate and choline metabolism, and polymorphisms in two pathways involving the genes CHDH and PEMT can impact betaine status.

Researchers discovered that men with the A allele in CHDH (rs12676) had reduced sperm motility. Sperm produced by men who have the AC genotype for rs12676 have 40% lower ATP concentrations, while sperm produced by men who are AA have 73% lower ATP concentrations.[10]

Genotyping the CHDH gene can help assess the need for these epigenetic strategies:

- Betaine consumption in animal studies has been shown to raise sperm density and improve spermatozoa quality, with these effects occurring on a timespan shorter than one spermatogenic cycle.
- Betaine plays a crucial role in maintaining sperm ATP levels by acting as a key osmolyte, protecting sperm cells from osmotic stress and thus supporting their motility.
- In humans, consuming a varied and balanced diet with an adequate supply of choline and betaine may mitigate the loss of activity in the CHDH pathway on fertility.
- Creatine provides sperm the power used to flip the tail and swim up the vaginal canal.
- The addition of creatine phosphate to the insemination media enhances the fertilizing capacity of sperm (both motility and velocity) during in vitro fertilization.

Clinical Application: The GSTP1 Gene

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There are two GSTP1 genes tested that have a significant impact on fertility: rs1695 and rs1138272. Research has shown that an overabundance of reactive oxygen species (ROS) may compromise sperm function, including sperm motility, altering DNA, and decreasing membrane integrity. One source of ROS comes from the exposure and sensitivity to chemicals and heavy metals that are suspected reasons for the increased risk of male infertility related to GSTP1 variants.

One of the most unique aspects of GSTP1 rs1695 is how each genotype responds to vitamin E supplementation, which is often broadly recommended for infertility cases. These genotype-specific differences may help explain some of the discordant results in studies that used vitamin E. People who have the alleles AA or AG in GSTP1 rs1695 had an increase in inflammatory interleukin-6 (IL-6) upon supplementing alpha-tocopherol while those with GG saw a decrease.[11] Men with the wild-type AA or heterozygous AG genotype in GSTP1 rs1695 should not supplement over 75 IU of alpha-tocopherol, while the GG genotype benefits from 400 IU or higher.

Clinical Application: The HFE C282Y Gene

Hemochromatosis is a well-established cause of infertility in both men and women. Iron overload poses risks for impaired sperm production, decreased sperm motility, and oxidative damage to sperm DNA. However, while homozygous carriers of HFE C282Y may experience a negative effect on fertility and require strategies for lowering iron to achieve pregnancy, heterozygous male and female carriers may have a reproductive advantage.[12]

Genotyping for the HFE C28Y2 gene can help uncover hemochromatosis as a potential cause of infertility with recommended strategies to lower and monitor iron levels.

Summary

myDNA provides nutrigenomic testing that assists patients in discovering the potential causes of infertility through genetic strengths and weaknesses. Discovering these high-impact variants helps practitioners make personalized dietary, supplemental, and lifestyle improvements that have the potential to change the lives of millions of people who are currently experiencing infertility.

Key

Sperm Count: The number of sperm cells present in a milliliter of semen. A normal total sperm count is generally considered to be 39 million sperm or higher.

Sperm Concentration: The density of sperm per milliliter of semen. A normal sperm concentration is generally considered to be 15 million sperm per milliliter or higher.

Sperm Motility: The ability of sperm cells to move efficiently through the female reproductive tract to fertilize an egg.

Sperm Morphology: The shape and size of the sperm.

SAMPLE

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Fertility Gene Summary Report

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Welcome to the future of health and human potential

ID:	NT4GH633
Name:	Tommy Howell
DOB:	12/03/85
Barcode:	NT4GH633
Date:	10/20/25

Gene	Gene Rsid	Wild Type	Heterozygous	Homozygous
9p21	9p21-rs1333049			CC
BCMO1 A379V	BCMO1 A379V-rs7501331	CC		
BCMO1 R267S	BCMO1 R267S-rs12934922			TT
BDNF	BDNF-rs6265	CC		
CAT C-262T	CAT C-262T-rs1001179	CC		
CHDH	CHDH-rs12676			CC
COMT	COMT-rs4680		AG	
CYP2R1	CYP2R1-rs10741657			GG
FADS2	FADS2-rs1535			GG
	FADS2-rs174575			GG
FUT2	FUT2-rs601338			AA
GC	GC-rs2282679	TT		
GGCX	GGCX-rs699664		CT	
GPX1	GPX1-rs1050450	GG		
GSTM1	GSTM1-rs366631	AA		
GSTP1 I105V	GSTP1 I105V-rs1695		AG	
HFE-C282Y	HFE-C282Y-rs1800562	GG		
MTHFR 677	MTHFR 677-rs1801133	GG		
NBPF3	NBPF3-rs4654748		CT	
PEMT	PEMT-rs12325817	CC		
PON1	PON1-rs662	TT		
PPCDC	PPCDC-rs2120019	TT		
SHBG	SHBG-rs12150660	GG		
	SHBG-rs6258	CC		
SLC23A1	SLC23A1-rs33972313	CC		
SOD2	SOD2-rs4880		AG	
TCF7L2	TCF7L2-rs7903146	CC		
TP53	TP53-rs1042522			CC
VDR FokI	VDR FokI-rs2228570			GG
VKORC1*2	VKORC1*2-rs9923231		CT	

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