Symphony

NATURAL HEALTH

A Whole Health Guide to Sperm Health

Supplement Disclaimer

For all supplements mentioned in this document: These statements have not been evaluated by the FDA. These products are not intended to diagnose, treat, cure, or prevent any disease.

Medical Disclaimer

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Empowerment & Knowledge

The male partner contributes up to 50% of fertility concerns, underscoring the importance of supporting reproductive health in both partners [1]. Research also highlights a concerning trend: an accelerating global decline in sperm concentration and total sperm count between 1973 and 2018 [2]. Testosterone levels have also declined at an accelerated rate since 1985, with research suggesting a 1% per year population level decline that may be due to exposure to endocrine disruptors rather than age or other lifestyle factors, which may further impact male fertility [3]. To put this in perspective, the average total testosterone level for a man in his 30s today is lower than that of a 65-year-old man in 1985 [4].

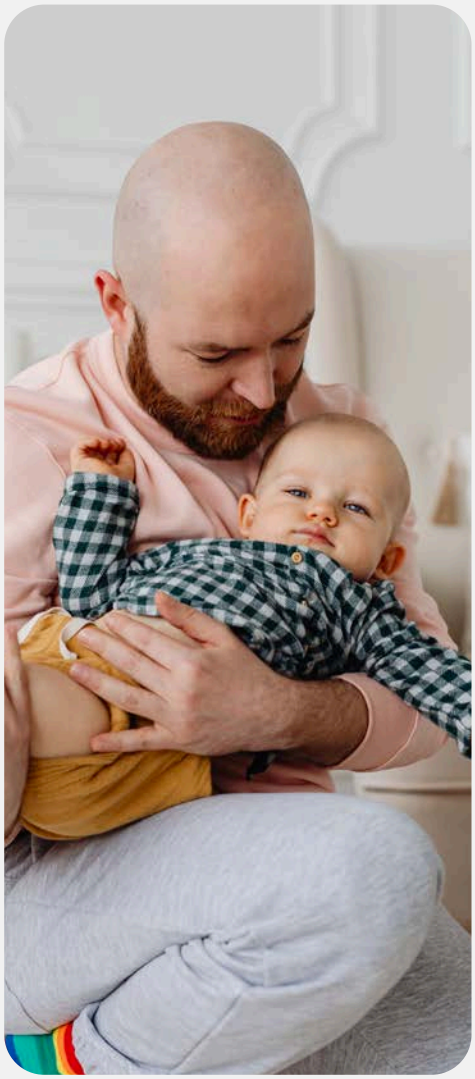


FIGURE 1

Estimated Sperm Parameters in 1973 vs. 2018

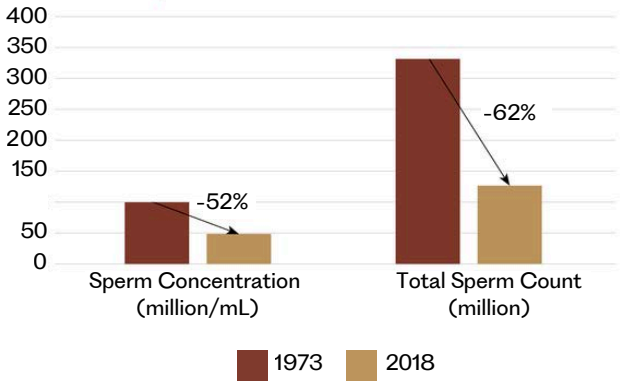
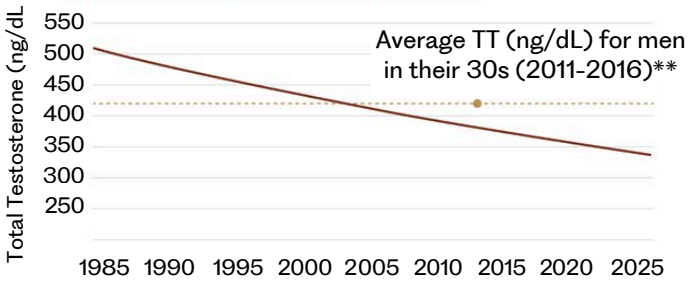


FIGURE 2

Estimated Total Testosterone (TT) Levels for 65-Year-Old Men from 1985 to 2025*



*Calculated based on MMAS data
**NHANES 2011-2016 data

How do I know if my sperm is healthy?

Some research suggests that semen could be a valuable health biomarker [5]. Yet unlike a woman's monthly menstrual cycle, which many consider a monthly vital sign, a man's semen quality usually goes unmonitored until he's trying to conceive. A semen analysis can be used to assess reproductive function, sperm health, and even overall health. It measures:

- Sperm count: Number of sperm, also known as sperm concentration [6]
- Total motility: Percentage of all moving sperm [7]
- Progressive motility: Percentage of sperm that are moving forward [7]
- Sperm morphology: Size, shape, and healthy appearance of sperm [8]
- Semen volume, viscosity, and pH levels [9]

Although a sample may be considered viable, other factors not measured in a semen analysis—such as nutrient status—may influence reproductive outcomes [10]. Still, an unfavorable semen analysis can indicate that these factors are of concern and need particular attention.

Sperm vs. Semen

Sperm and semen are related but distinct. Sperm are the individual reproductive cells that carry genetic material to fertilize a female egg while semen is a combination of seminal plasma and sperm [11]. Seminal plasma, which makes up about 95% of semen, plays an important role in fertility by providing nutrients, such as zinc and cholesterol, and pH buffering for sperm motility and appropriately-timed capacitation, which allows the sperm to fertilize an egg [12]. Though sperm health is of great importance, semen quality is equally critical as it provides the environment sperm need to survive and ultimately fertilize an egg.

Next steps...
This guide discusses practical strategies to support healthy sperm—and seminal plasma—through diet, exercise, and lifestyle. However, if you have any hormone- or fertility-related health concerns, you should visit your healthcare provider for an evaluation. They can assess the severity of your symptoms and discuss the wide array of options you have. Every person has beliefs about life, health, and medicine, so finding a practitioner aligned with those values is imperative.

Hormones

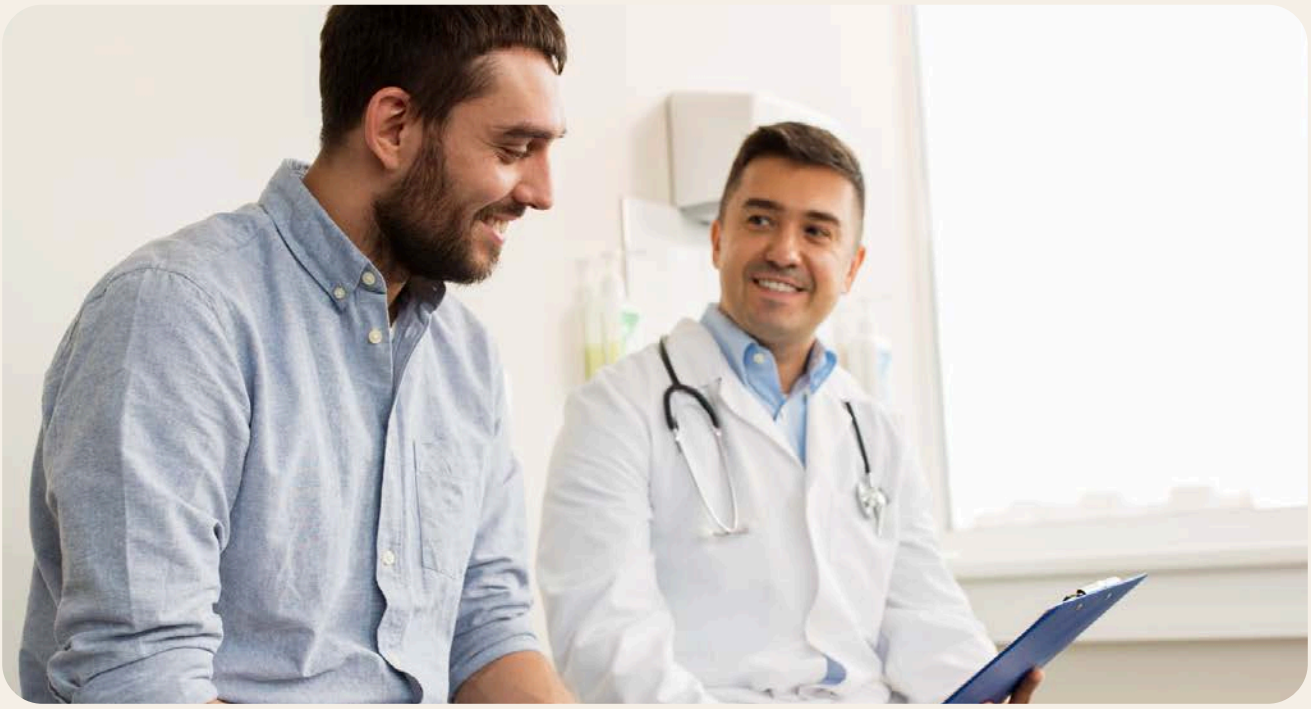
Key Communicators In The Body

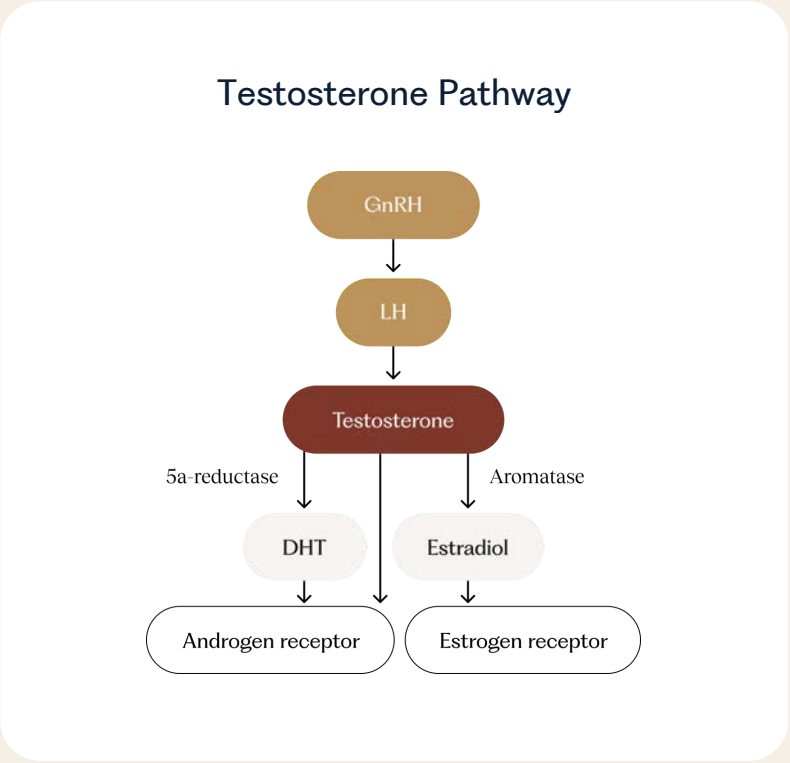
How does the body communicate within?

All information in the body is received through two types of messengers: neurotransmitters and hormones. Neurotransmitters help cells communicate through the nervous system, but hormones help communicate cell-to-cell or from one cell through the bloodstream to another cell.

How do hormones align with sperm health?

Though testosterone is well-known for its role in men's health, lesser-known hormones, such as follicle-stimulating hormone (FSH) and growth hormone, play important roles in sperm health.





Testosterone

Testosterone is required for the initiation and maintenance of sperm production [13]. Free testosterone refers to testosterone that is not bound to sex hormone-binding globulin (SHBG) and is therefore available to cells [14]. It may offer a more accurate picture of hormonal changes compared to total testosterone [15].

Luteinizing hormone

Signals the Leydig cells in the testes to make testosterone [13].

Estrogen

Estrogen is predominantly considered a female hormone, but it's present in males, too. Beyond its role in supporting the development of the male reproductive system, estrogen also appears to support sperm maturation [16]. However, it's important that estrogen remains balanced with androgens to maintain reproductive function. High levels of this hormone, such as from environmental estrogens, could negatively affect male fertility.

Follicle-stimulating hormone (FSH)

Supports normal and functional Sertoli cells, which facilitate sperm production [16,17].

Gonadotropin-releasing hormone (GnRH)

Stimulates LH and FSH synthesis [18].

Prolactin

High levels of prolactin interfere with the production of FSH and LH, thereby affecting sperm production [19].

Growth hormone

Supports sperm production and sexual function [20].

The Way to Feel "At H.O.M.E" in Your Body: Four Steps to Hormone Balance

Hormone balance begins in the brain in the hypothalamus, cascading down through the pituitary, adrenal glands, and eventually the testes. This signaling then circles back to the hypothalamus, creating a continuous feedback loop for ongoing communication between those organs. This process is referred to as the hypothalamus-pituitary-adrenal-testes (HPAT) axis.

However, many factors affect how efficiently this communication system works. To improve the body's communication and have seamless signals and ready responses from the endocrine system and beyond, we need to look at four different processes, which are all happening simultaneously in your body. When these four aspects are taken care of, you can support healthy sperm and feel more "at HOME" in your body.

If you can remember the H.O.M.E. acronym, you'll easily recall how to promote healthy sperm and, ultimately, endocrine health.

Harmonization

The whole body seeks harmony, with its organ systems working in concert like a well-orchestrated symphony. Countless processes operate within constant checks and balances, ensuring stability and seamless communication – a foundation for men's health. Harmonization for men's health may be supported in several ways. To the best of our ability, we need to eat a nutritious diet, move our bodies in enjoyable and sustainable ways, attain a good night's rest, and practice stress management techniques to help support healthy hormones and sperm.

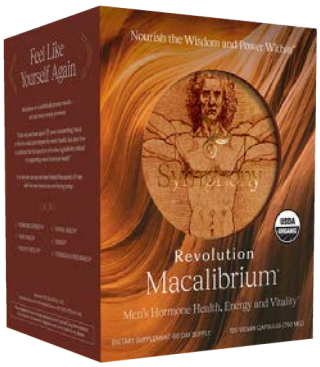
In this guide, we will help you get ideas to make this shift. Sometimes you may need to work with a healthcare professional to guide you in making these changes "stick." It takes time, attention, and focus to adjust your overall health. However, it's well worth it, because if you don't address the overall health, the symphony inside will be a cacophony of noise. Some practitioners recommend supporting sperm health for four months prior to conception.

Optimization

Optimization for men's health means harmonizing your diet and lifestyle to support your endocrine system and set the stage for balanced hormones and healthy sperm. An all-or-nothing approach is usually not beneficial when it comes to making changes for your health. Though you don't have control over genetic changes that may innately influence hormone metabolism or sperm health, you can do your best within your circumstances. You do have a locus of control around several factors, including your diet, sleep schedule, and other lifestyle factors, like exercise. Optimizing your lifestyle sets the stage for balanced hormones, which promote healthy reproductive function and sperm.

In this guide, we provide you with tips to make changes to your food intake, exercise, and lifestyle factors to best support healthy sperm.

Revolution Macalibrium® for Men



As part of this Optimization process, additional support for the endocrine system can further help the body maintain healthy hormone production. Revolution Macalibrium® supports optimal functioning of the hypothalamus-pituitary-adrenal-testicular (HPAT) axis, the network that regulates hormone production and influences sperm health. Revolution Macalibrium® is made from a targeted concentration of maca phenotypes grown at specific altitudes, harvested by hand, and prepared for maximum bioavailability and hormonal impact. Most people think of maca as one plant. In reality, there are up to 17 different phenotypes that can be different colors, have different DNA, different active ingredient profiles and most importantly, different effects in the body [22].

For example, when it comes to fertility, there is one type of maca that is optimal for men's fertility and a completely different phenotype for women's fertility. Even more impactful on efficacy and function is the location and elevation it is grown and how it is manufactured. Revolution Macalibrium® has concentrated levels of key active ingredients up to 10x higher than raw maca. Its water solubility is 99% as compared to raw maca, which is 68%, improving bioavailability and absorption. Preliminary research suggests possible effects on sperm parameters and reproductive health, though more studies are needed to confirm these findings [23].

Metabolism

When you begin to improve sperm health, you're also supporting the metabolic systems behind it—particularly insulin balance, which indirectly affects semen quality [21]. To best support metabolism, try to eat balanced meals rich in dietary fibers, phytonutrients, and plenty of protein. Working with a healthcare provider is advised to help you discover a personalized diet tailored to your unique physiology and health needs.

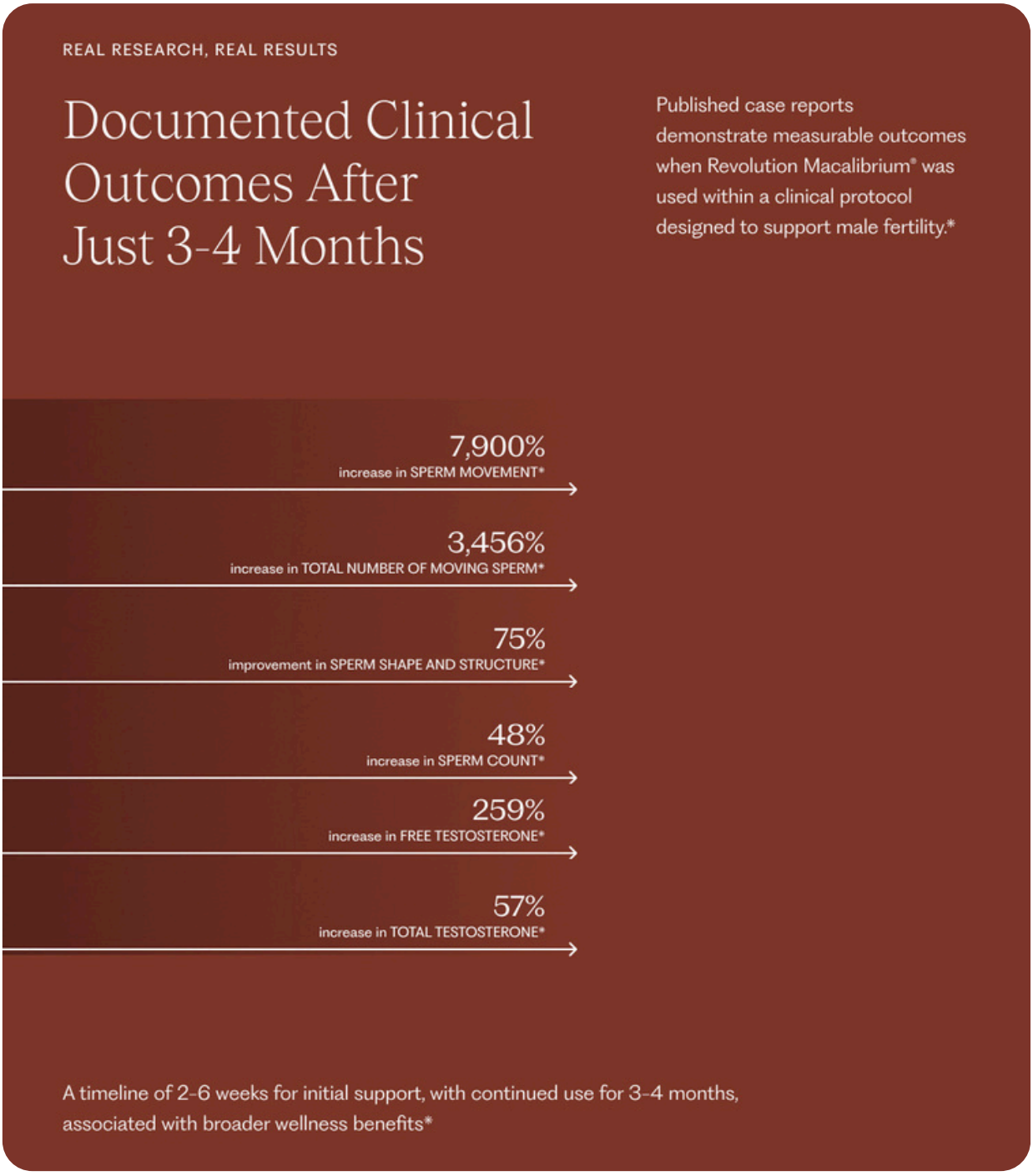
In this guide, we provide you with strategies to make changes to your diet and nutrition for healthy sperm.

Elimination

The body eliminates hormones, such as testosterone, and their metabolites through urine, although a small percentage is eliminated in the feces. Ideally, the body makes hormones, uses them, and then efficiently eliminates them so they do not build up. Ensuring adequate liquid intake to promote proper elimination may help support a healthy endocrine system. Additionally, prioritizing foods, such as fiber, promotes the healthy elimination of hormones via the stool. For additional support, pH Quintessence, a 40:1 Alfalfa Concentrate rich in chlorophyll, antioxidants, vitamins, minerals and essential amino acids, can support detox and the metabolism of hormones.*

In this guide, we provide you with strategies to support proper digestion and elimination.

In a recent case report, a 38-year-old Indian male sought care to help with reproductive health. His health history included metabolic, hormonal, and digestive health concerns [23]. He also wanted to support healthy sperm motility. After following a comprehensive clinical protocol for six months, which included taking 1500 mg of Revolution Macalibrium® twice daily for about four months, the man experienced a 57% increase in total testosterone levels. His fertility markers were also reported to improve, as shown below.



As part of the integrative clinical protocol, the individual was advised to follow or continue:

- A vegetarian and Paleo-style diet
- A physical activity regimen that included aerobic exercises such as walking and high-intensity interval training for at least 30 minutes daily
- Stress reduction techniques, which included yoga
- A robust sleeping schedule that provided at least eight hours each night

Additionally, he was directed to ice his testes for 15 minutes daily. "Scrotal cooling" may support sperm health by maintaining a healthy inflammatory response [24]. While a whole-health approach could quickly become overwhelming, it can also create an opportunity for you to feel fully supported in all aspects of your life. Case reports are useful for illustrating how a whole-health approach to fertility may look in practical applications. However, results from this case study reflect a particular patient and may not represent individual experiences.

For a more detailed look at the personalized supplement and lifestyle intervention provided in this case report, read the full paper.

Diet & Nutrition

Everyday food choices are a powerful lever in supporting fertility, providing ongoing opportunities to strengthen antioxidant defenses and supply key nutrients that contribute to healthy sperm and the seminal fluid that carries them.

Different eating patterns can support or work against reproductive health. A Western-style diet offers poor support for metabolic health, which has downstream effects on sperm health due to factors like hormone imbalance and oxidative stress [25]. A Western-style diet is characterized by high intake of ultraprocessed foods, simple carbohydrates and sugars, animal proteins, and trans and saturated fats paired with low intake of dietary fiber and unsaturated fatty acids.

On the contrary, a Mediterranean diet is associated with positive changes in both the number and quality of sperm [25]. A Mediterranean diet is characterized by high consumption of plants and healthy fats, with animal-based products primarily consisting of fish, poultry, and some dairy [26]. This way of eating provides foods rich in fiber, omega-3 fatty acids, vitamins, and antioxidants, all of which can support metabolic health and a healthy inflammatory response. Traditionally, the Mediterranean diet also embraced seasonal variability in food choices, promoting a diverse intake of nutrients.

Even though one's diet needs to be personalized, here are some general nutrition guidelines that can support sperm health.

Drink Water

Proper hydration facilitates nutrient delivery throughout the body in addition to many other physiological functions, such as temperature regulation. It is also critical to support regular bowel movements, urination, and sweating — our three routes of eliminating waste from our bodies. Because consuming sugar-sweetened beverages (e.g., soft drinks) can negatively affect sperm sperm count, replacing these beverages with water could support sperm production.

Do you find water boring?

Do you find water boring? Add fruits like oranges, lemons, limes, and grapefruit, herbs like mint, cilantro, and rosemary, or vegetables like cucumbers. Get creative and combine some of these fruits, herbs, and vegetables, such as cucumber & mint or grapefruit & rosemary. Additionally, if you drink water but still feel dehydrated, you may consider mineralizing your water using Sole (a super-saturated Himalayan crystal salt solution).

One study demonstrated that mineralized water increased hydration indicators by 10% and was effective in stabilizing pH [28]. A clinical study looked at the effect of consuming Sole made with Original Himalayan Crystal Salt® or a brine solution with table salt [29]. After 30 days of daily use, the group consuming Sole had better indicators of hydration, mineralization, and oxidative stress compared to the group containing a table salt brine.

Dietary Protein

A balanced approach to protein is important for reproductive health—while a moderate protein intake is supportive, both low protein (diets with 2–10% protein) and high protein (diets with >3.4 g protein per kg body weight) diets may have a negative impact on testosterone levels [30,31].

Though there are no definitive protein guidelines for sperm health, there are several ways to approach protein intake. For active men, intake of 1.0, 1.3, and 1.6 g/kg BW is recommended to support muscle for those with minimal, moderate, and intense physical activity, respectively [32]. It is also suggested that protein intake of about 25% of caloric intake or up to 2 g per kg body weight is appropriate for men [32].

Include proteins, such as:

- Wild-caught fish (sardines, salmon)
- Pasture-raised poultry (chicken, turkey)
- Grass-fed meat (beef, bison, buffalo, lamb)
- Beans and legumes (e.g., chickpeas and lentils)
- Pasture-raised eggs
- Soy-based proteins (tofu, tempeh)

When possible, prioritize organic proteins. Factors impacting the amount of protein you consume include your exercise routine and goals, diet preferences, and existing health conditions. It's recommended to work with your healthcare provider or a qualified nutritionist to determine your personal protein requirements.

Is Soy Safe for Men to Eat? It is a common belief that men should not eat soy due to its phytoestrogen content, but evidence does not indicate a significant effect of soy on testosterone or estrogen levels [33]. Additionally, clinical research does not suggest an effect of soy on sperm parameters [33]. On the other hand, bioactives in soy, such as isoflavones, have antioxidant properties that may benefit male health.

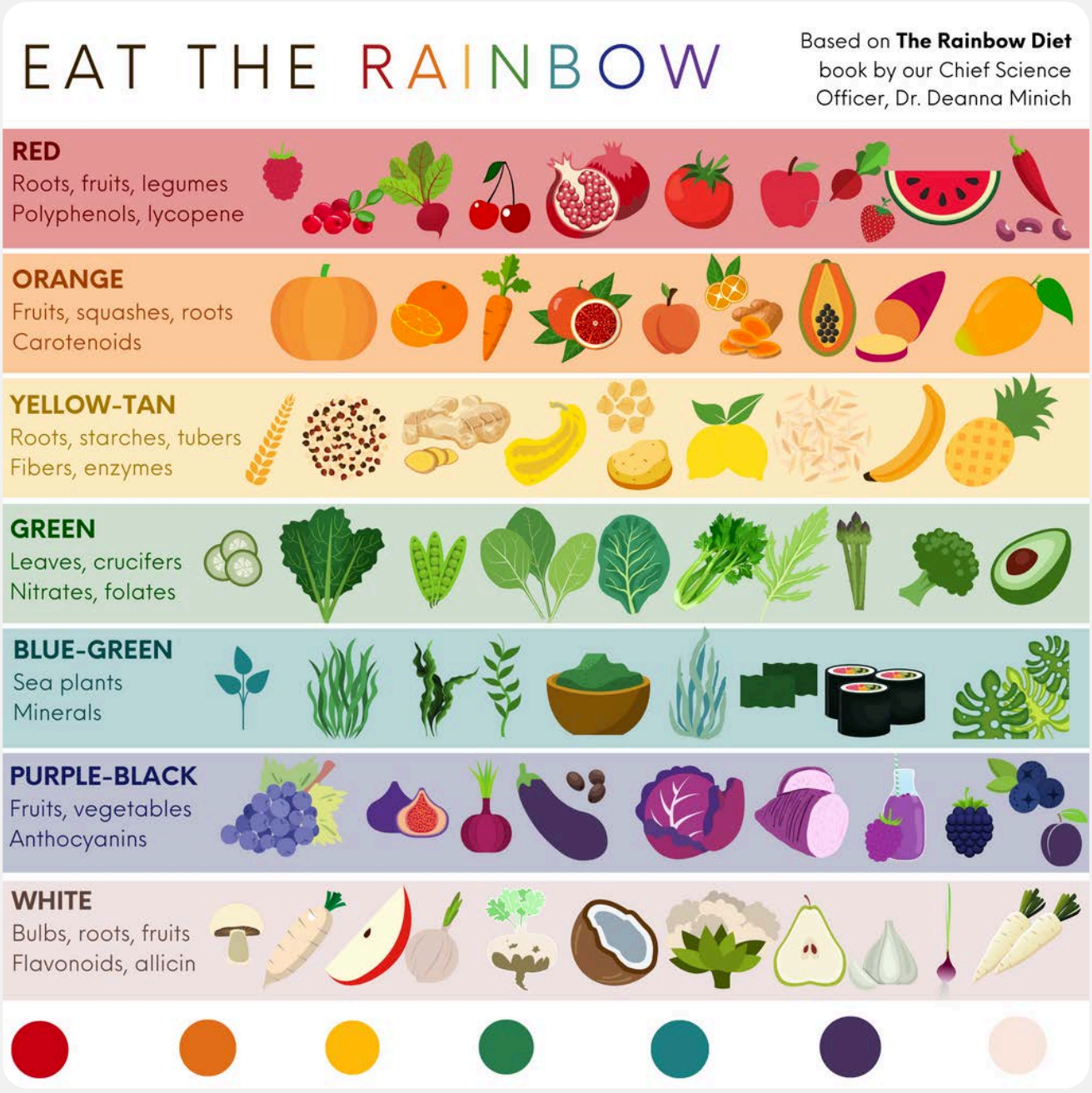
Fruits and Vegetables

Fruits and vegetables provide antioxidant-rich phytochemicals, like carotenoids, which can help manage the oxidative stress that affects sperm health [34]. Lycopene is a carotenoid known for its antioxidant properties and role in men's reproductive health, and it can help protect sperm from oxidative damage and support sperm concentration. In fact, lycopene accumulates in the testes, where levels can be up to 10 times higher compared to other organs [35]. If you want to consume more lycopene, look for red foods such as apricots, cranberries, melons, watermelon, tomatoes, and even tomato products like marinara sauce [36]. Lycopene provides the red pigment to foods such as these. When possible, choose organic options (see pages 25-26).

Supplemental fruits and vegetables may include:

- Concentrated fruit and vegetable powder
- Multivitamins with plant extracts
- Mushroom powders
- Cocoa powder
- Spirulina powder

Aiming to “eat the rainbow” is a fun way to include more phytonutrient-rich plants in your diet. Eat one serving of each color of the rainbow daily.



Learn More: The Rainbow Diet: A Guidebook to the Science and Art of Colorful Foods for Health and Well-Being

Fats and oils

Fats are essential for helping the body absorb the fat-soluble vitamins A, D, E, and K, and they are also incorporated into cell membranes for structure and function [37]. Some dietary fats, especially those from plants, support a healthy inflammatory balance in the body [38].

Include healthy fats, such as:

- Avocado
- Nuts: Almonds, walnuts
- Oils: Extra-virgin olive oil, flaxseed, pumpkin seed, avocado, and sesame
- Olives
- Seeds: Flaxseeds, chia seeds, sesame seeds, hemp seeds, and pumpkin seeds

Supplemental fatty acids may include:

- Omega-3 fatty acids concentrated in long-chain omega-3 fatty acids such as EPA and DHA
- Omega-3 fatty acids from algal sources, typically higher in DHA
- Flaxseed oil
- MCT oil

Omega-3 fatty acids, which are found in fish like salmon and trout, support sperm health and the quality of semen, the latter of which contains high levels of docosahexaenoic acid (DHA), one of the omega-3 fatty acids [39]. DHA is important to sperm health because it supports sperm membrane fluidity and, consequently, fusion with the egg at conception [40].

One study found that the simple practice of adding nuts to a Western-style diet every day for 14 weeks was associated with statistically significant changes in sperm count, motility, and morphology [41]. The amount of nuts consumed daily in the study was equivalent to approximately two ounces.

Whole grains

Whole grains provide fiber to support a healthy metabolism, which has a significant effect on hormone balance and metabolic health [42]. It's recommended that men consume 30-38 g fiber per day or 14 g fiber per 1000 calories per day [43].

Unless otherwise indicated, include organic whole grains, such as:

- Brown rice
- Buckwheat
- Millet
- Oats
- Quinoa

Supplemental fibers may include:

- Himalayan tartary buckwheat powder
- Chia seeds

Note: Choose gluten-free options as needed or as directed by your healthcare provider.

Rice may contain arsenic, a toxic heavy metal. Parboiling rice is shown to be the most effective way to remove arsenic from rice [44]. To parboil rice, you should 1) Boil fresh water, 2) Add rice and boil for 5 minutes, 3) Discard the water, 4) Add fresh water to rice and cook according to normal preparation instructions (e.g., 2 cups of water for each 1 cup of raw rice)

Reduce or avoid

Food sensitivities, intolerances, and allergies.
Work with your healthcare provider to determine whether you have any food sensitivities, intolerances, or allergies through laboratory testing or elimination from the diet. These foods may include:

- Caffeine (e.g., coffee, energy drinks, soft drinks, teas)
- Corn (e.g., chips, tortillas)
- Dairy products (e.g., cheese, milk, yogurt)
- Gluten (e.g., barley, rye, wheat, spelt)
- Peanuts
- Shellfish

Caffeine

High caffeine consumption may adversely affect semen quality, especially if it affects sleep [45,46]. Research also suggests that caffeine may impact Sertoli cells, which are involved in sperm production [47]. When minimizing caffeine intake to support healthy sperm, it's important to recognize the many caffeinated products beyond coffee. This includes caffeinated tea, energy drinks, soft drinks, pre-workout products, and even sports products, such as pre-workout powders, carbohydrate gels, and electrolyte powders. If you do consume caffeine, ensure you do so in the earlier part of the day so that sleep is not disrupted.

Processed/refined carbohydrates.
Minimizing your intake of processed and refined carbohydrates helps maintain healthy blood sugar balance and a healthy inflammatory response [48].

- Breads, especially white bread
- Chips
- Crackers
- Fruit juice
- Pancakes and waffles
- Pastas
- Ready-to-eat cereal
- Soft drinks
- White flour
- White sugar and other refined sweeteners

Dietary advanced glycation end products.

Many common foods contain damaged, complexed proteins and fats called Advanced Glycation End products (AGEs), which are known to be associated with changes in inflammatory balance and accelerated aging [49]. Animal studies suggest that AGEs inhibit testosterone production in the testes, which contain receptors for AGEs (RAGE), and may have adverse effects on sperm [50,51].

AGEs can be found in foods that are high in fat, protein, and/or sugar, especially in those that are prepared using cooking methods that involve high and dry heat (e.g., grilling, roasting, and frying) [49]. Examples of foods high in AGEs include:

- Grilled, fried, or roasted meats (e.g., bacon)
- High-fat and aged cheeses
- High-fat spreads
- Roasted nuts




Alcohol

Heavy alcohol consumption may have adverse effects on male fertility by affecting semen quality and sex hormone levels, including testosterone and FSH, both of which are important for healthy sperm production [52]. Though more research is needed, current evidence suggests that low or moderate alcohol consumption does not have a significant impact on male fertility [53]. That said, people metabolize alcohol differently, and individual responses may vary. Some practitioners recommend avoiding alcohol entirely for the four months prior to conception.

Increase your intake of key nutrients

Several key nutrients can support healthy sperm. While it's ideal to take a "food first" approach to nutrition, supplements can help you meet your daily goals. This guide includes key nutrients for sperm health, food sources for each nutrient, and supplement guidelines to consider if more support is needed. Most listed nutrients can be found in multivitamins, which provide more comprehensive and balanced support compared to supplementing with individual nutrients. Before beginning dietary supplements, it's important to discuss them with your healthcare provider to ensure they're safe and appropriate for you.

Coenzyme Q10

Coenzyme Q10—also referred to as simply CoQ10—plays two important roles in sperm health [54]. First, it supports ATP production in the sperm mitochondria, powering sperm movement. Second, it functions as an antioxidant, supporting healthy levels of oxidative stress in sperm and semen. Food sources include fish, organ meats, and whole grains.

Suggested Intake	100–300 mg/day [54]
Supplement form	Coenzyme Q10

Folate

Folate is a coenzyme involved in DNA metabolism, helping maintain DNA integrity and the normal functioning of cellular processes necessary for the production and movement of sperm [55]. Though sperm is produced over approximately three to four months, millions are produced each day, with each requiring DNA metabolism [56]. Food sources include asparagus, Brussels sprouts, broccoli, citrus fruits, dark leafy green vegetables (e.g., kale and spinach), and eggs.

Suggested Intake	400–1,700 mcg DFE* [57]
Supplement form	L-Methylfolate (L-5-MTHF)

*Several studies have reported positive effects from high-dose folate supplementation well above the listed range; however, more research is needed to understand the risks associated with long-term supplementation at such doses [58].

Iron

Iron is required in several processes related to testosterone and sperm production, including iron-dependent enzymes in Leydig and Sertoli cells that influence DNA synthesis and mitochondrial function [59]. Food sources include beans, lentils, spinach, red meat, poultry (dark meat). Cooking with cast iron pans is another way to include iron in your diet [60].

Suggested Intake	8 mg/day* [61]
Supplement form	Ferrous Bisglycinate

*The recommended dietary allowance (RDA) for iron for adult men is 8 mg/day. However, most men do not need to supplement with iron. In fact, excessive iron intake can be harmful to your health and affect healthy testicular function [62]. For this reason, most multivitamins do not include it. Before supplementing, it's important to assess your iron levels via a blood test with your healthcare provider.

Lycopene

Lycopene can help protect sperm from oxidative damage and support sperm concentration [34]. In fact, lycopene accumulates in the testes, where levels can be up to 10 times higher compared to other organs [35]. Food sources include apricots, cranberries, melons, watermelon, tomatoes, and even tomato products like marinara sauce. It is occasionally included in multivitamin supplements.

Suggested Intake	6-8 mg/day* [63]
Supplement form	Lycopene

Vitamin C

Vitamin C is significantly more concentrated in seminal plasma compared to blood serum, protecting sperm from oxidative stress and DNA damage due to its antioxidant effects [54]. Food sources include broccoli, citrus fruits, peppers, strawberries, tomatoes.

Suggested Intake	250-1000 mg/day [54,64]
Supplement form	Ascorbic Acid

Note: Excessive intake of vitamin C (>2,000 mg/day) can cause digestive upset, including diarrhea and abdominal cramps.

Vitamin D

Vitamin D supports healthy testosterone levels and helps regulate sperm motility and function [54]. It's recommended that you assess your vitamin D levels with your healthcare provider to tailor your supplemental intake. Food sources include fish (e.g., trout and salmon), liver, cheese, egg yolks, mushrooms, and fortified foods, such as milk [65]. It is also possible to gain some vitamin D through sun exposure, though several factors can impair this process, including the season, air pollution, clothing, sunscreen use, and skin pigmentation [66].

Suggested Intake	1,500–10,000 IU/day* [66]
Supplement form	Vitamin D3 (cholecalciferol)**

*It's recommended that you speak with your healthcare provider about assessing your vitamin D levels via a blood test to personalize your supplementation protocol and optimize your levels.
**If vegan, look for a plant-based vitamin D supplement.

Vitamin E

Vitamin E functions as an antioxidant, supporting healthy levels of oxidative stress in sperm membranes, where it is concentrated [54]. Food sources include sunflower seeds, almonds, hazelnuts, peanuts, spinach, and broccoli.

Suggested Intake	15–400 mg* [63,67]
Supplement form	Mixed tocopherols or alpha tocopherol

*Most multivitamins contain less than 100 mg vitamin E. However, evidence suggests short term uses of higher doses may support sperm health [63]. It's recommended that you speak with your healthcare provider about high doses of vitamin E to ensure it is appropriate for you.

Zinc

Zinc is a co-factor for antioxidant enzymes, supporting healthy levels of oxidative stress in sperm and semen [68]. It also supports healthy testosterone levels, sperm production, and sperm motility. However, it's important to maintain a healthy zinc-to-copper ratio as excessive zinc intake can impair copper absorption [69]. For this reason, many multivitamins contain small amounts of copper. It is typically recommended to supplement with 1 mg copper for every 8 to 16 mg zinc [70]. Zinc food sources include brown rice, crab, dairy products, eggs, oats, oysters, peanuts, pumpkin seeds, shrimp, soybeans.

Suggested Intake	15-40 mg/day [63]
Supplement form	Zinc Bisglycinate

Omega-3 fatty acids

Omega-3 fatty acids have antioxidant effects and support a healthy inflammatory balance [54]. They support and stabilize the structural integrity and fluidity of sperm membranes, and evidence suggests they may support healthy sperm parameters, including sperm count, motility, and morphology [54]. Food sources include fish (e.g., salmon, herring, sardines, mackerel, and trout), flaxseeds, and chia seeds [71].

Suggested Intake	1.5-2 g/day [72]
Supplement form	Eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA)

Creatine

Men's reproductive health may be supported by creatine, too. Not only is creatine present in semen, but it also plays an important role in energy metabolism in sperm [73]. Creatine can be consumed via muscle meats or dietary supplements. If using supplements, the standard suggestion is to use 3-5 g or 0.1 g/kg body weight of creatine monohydrate per day [74].

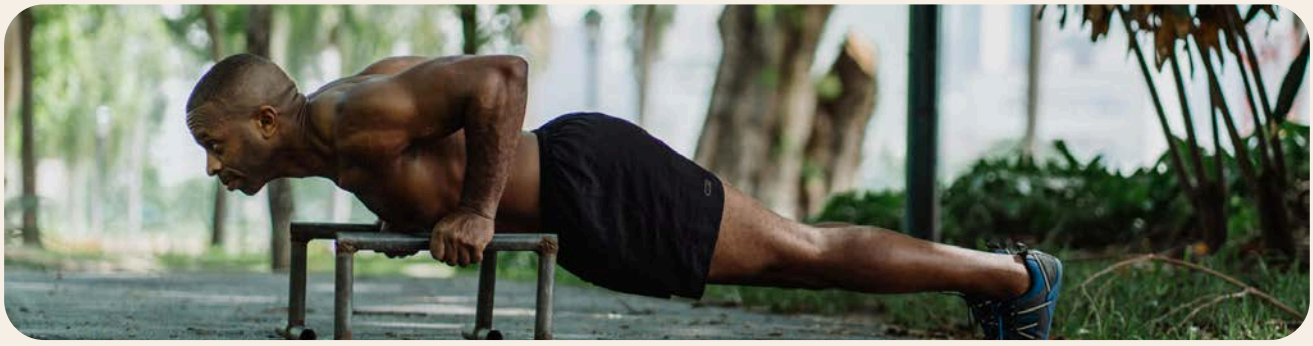
Exercise & Movement

Exercise is fundamental for maintaining overall health, and it is suggested that it can help support sperm health due to its role in [75]:

- Regulating the HPG axis and hormone production [76]
- Supporting healthy blood flow to reproductive organs [77]
- Maintaining normal levels of oxidative stress via antioxidant defenses [77]
- Supporting mood and the stress response [76]

Interestingly, semen quality and physical activity appear to have an inverse U-shaped association. A 2025 study found that men engaging in moderate physical activity showed better semen quality compared to sedentary men or men with high physical activity [78]. This means that there was a “happy medium” for the effect of exercise on sperm health in this study, with too much and too little having potential adverse effects.

A healthy level of exercise for sperm health can be achieved by following the adult physical activity guideline of at least 150-300 minutes of moderate-intensity exercise each week, ideally across 3-5 days [76]. For those with existing metabolic health concerns, exercise can be particularly helpful in supporting sperm production and semen quality by maintaining testicular antioxidant defenses, a healthy inflammatory response, and hormone production [79]. Exercise also supports a healthy weight, protecting sperm quality from the potentially adverse effects of excess body fat [80].



There are many options to choose from when starting an exercise routine, and some evidence suggests benefits for diverse, whole-body exercise [76]. For example, resistance training in particular may support sperm morphology, and it may be especially supportive for fertility when combined with aerobic training [76,81]. On the other hand, yoga has the potential to support sperm count, motility, and morphology [76]. Cycling may support sperm concentration, though it has also been shown to negatively impact sperm health [76,82]. However, this may be due to improper posture, tight clothing, duration, and frequency [76,83].

Excessive exercise can contribute to oxidative stress and hormone imbalances, especially when paired with insufficient food intake [83]. In order to sufficiently recover from exercise and support healthy hormone levels, it's important to be mindful of exercise intensity and incorporate enough rest days, which will vary based on your exercise history and training routine. If your exercise performance is stagnant or declining, it may be time to reassess your training routine and eating habits.

Some tips to help you move more

Do what you enjoy! For some, it may mean heading to the gym. For others, it can be a team sport or outdoor activity, such as hiking. Find a combination of activities that you enjoy.

Add some resistance activities — consider squats, lunges, push-ups, resistance bands and/or light weights to support muscle mass, sperm health, and metabolic function.

Find a buddy or group to stay active with, whether it's finding a gym partner, joining a sports league, or taking classes. This could include a hiking group, golf or pickleball league, soccer team, martial arts, or fitness classes like yoga or Pilates.

Schedule a time with yourself for exercise to help maintain consistency! Consider hiring a personal trainer to keep you accountable or joining a gym that's convenient, such as one that's on the way home from work.

Find loose-fitting workout clothing that you can feel comfortable moving in while reducing scrotal heat stress.

Seek assistance from a trained professional for help creating the ideal exercise routine. With their support, you can ensure exercise meets your likes, time schedule, and addresses any health or mobility concerns.

Lifestyle & Environment

Lifestyle factors, including exposure to environmental toxins and poor sleep, are believed to play a role in changing sperm health.

Environmental toxins

Environmental toxins are nearly ubiquitous in modern life—they are present in food, water, air, personal care products like deodorant, shampoo, and shaving cream, and many of the other miscellaneous items you come into contact with every day, such as food storage containers and even store receipts. In fact, environmental toxins are not only found in blood and urine, they're found in semen, too [84]. Environmental toxins, such as bisphenol A (BPA), phthalates, and poly- and per-fluoroalkyl substances (PFAS) or "forever chemicals", can affect hormone balance, sperm production, and sperm function. Perhaps unsurprisingly, changes in sperm health appear to coincide with increasing global pollution.

Clothing can expose you to environmental toxins, too. Per- and polyfluoroalkyl substances (PFAS) are commonly used in textiles because they're able to repel water and oil [85]. Waterproof clothing, such as rain jackets or other outdoor clothing items, often contain PFAS for this reason. For these same reasons, PFAS may be found in athletic clothing and underwear. Unfortunately, it's possible to absorb PFAS via the skin, contributing to endocrine disruption and changes in sperm quality [84,86]. Children's clothing may also contain PFAS to provide stain-resistance, making this another exposure source for men who already have children [87]. Of course, this can affect the health of your children, too, whose lower body weight may result in a greater body burden during sensitive developmental periods.

Microplastics, which have been detected in semen, are another concern for men [88]. Research shows that men with polyethylene microplastics detected in their semen experience changes in progressive sperm motility, or the percentage of forward-moving sperm [88]. It's important to remember that microplastics are not just tiny plastic fibers—they contain the chemicals used to make plastic, such as phthalates, as well as environmental toxins that collect onto the surface of microplastics [89]. These chemicals leach into the body after microplastics are ingested, inhaled, or absorbed via the skin. Sources of microplastics include personal care products like exfoliating skin cleansers, tap water, seafood, airborne particles, and synthetic clothing, such as those made with polyester, which shed fibers while being laundered [90,91]. Plastic water bottles can directly introduce microplastics into the body each time the cap is twisted on and off, especially for old reusable plastic water bottles that undergo wear and tear every day [90].

Below is a list of common environmental toxins and their sources. While it is impossible to eliminate all exposures, reducing how often you come into contact with these products can help reduce your overall toxin load.

Toxin	Source
Bisphenols (e.g., BPA, BPS) [84.92]	Canned foods with bisphenol liners, plastic food and beverage containers, store receipts, tap water*
Phthalates [93]	Clothing, certain beverages (e.g., soft drinks and alcohol), building materials, scented products (e.g., cologne and air fresheners)
Poly- and per-fluoroalkyl substances (PFAS) [94]	Non-stick cookware, coated cardboard food containers, waterproof clothing, mattresses, tap water*
Pesticides [95,96]	Inorganic fruits and vegetables**, yard and lawn products (e.g., Roundup), lawns at parks and golf courses, tap water
Parabens [97,98]	Personal care products (e.g., handsoap, shampoo), laundry detergent, tap water*

*You can check the quality of your local tap water using the Environmental Working Group's Tap Water Database. Use the Water Filter Guide if you need help choosing an appropriate water filtration system for your area.

**Organic fruits and vegetables contain less, but not zero, pesticides. Refer to the Environmental Working Group's most recent "Clean Fifteen" and "Dirty Dozen" lists to help guide your food choices.

Occupational exposures to environmental toxins.

Many male-dominated careers come with occupational hazards due to toxin exposure. This includes careers in firefighting, construction, welding, automotive trades, and more. Such careers can expose someone to toxic fumes and heavy metals like lead, even when using the appropriate protective equipment [99]. Polycyclic aromatic hydrocarbons (PAHs) are environmental toxins especially relevant in occupational settings as many exposures come from sources like wildfires, heavy machinery exhaust, asphalt, manufacturing industries (e.g., rubber, iron and steel, aluminum, and cement), and power production [100].

Nutrition can play a supportive role for men in these careers by supporting the body's natural detoxification pathways and helping counter oxidative stress. Focus on hydration and a high fiber diet, and pay particular attention to cruciferous vegetables, such as kale, broccoli, and cabbage, for detoxification support.

Tattoos

A popular trend for men is getting tattoos. As one might expect, tattoo ink is a source of toxins, such as heavy metals and polycyclic aromatic hydrocarbons (PAHs) [101]. Despite being injected into the skin, approximately 60-90% of the pigment is transported to other organs via the lymphatic system [101]. The theoretical concern about tattoos is that they are permanently placed on the body and can present concerns over a man's life, which may be compounded by the accumulation of other toxic exposures, in addition to reduced efficiency of metabolic detoxification pathways over his lifetime. Overall, the bottom line is that tattoos add to the total toxic load. Even though it's considered a less toxic tattoo ink color, black ink has been shown to contain phthalates and produce reactive oxygen species, which contribute to oxidative stress [102,103]. On the other hand, red is considered to be the most toxic ink color, followed by green [102]. While more research is needed, it is suggested that small tattoo particles could accumulate in the testes by crossing the blood-testes barrier, potentially damaging sperm [103].

Cigarettes and drugs. Sperm are susceptible to damage. Taking up to four months to form, they are adversely affected by a host of dietary, lifestyle, and environmental factors [104]. Though often used as a way to relax, cigarettes and social drugs—including cannabis—may affect sperm health [105,106]. Cigarettes contain over 600 ingredients and produce over 7,000 chemicals when smoked [107]. One study found that compared to non-smokers, smokers demonstrated lower ejaculate volume and lower values for sperm quality parameters, including sperm concentration, morphology, and total motility [107]. Though this study doesn't establish causation, it highlights the potential effects of cigarettes on sperm health. On the other hand, cannabis is a more natural product, and as a result, it's often assumed to have little consequence. However, THC disrupts the endocannabinoid system in the male reproductive system, which may affect sperm mitochondria, and ultimately, motility [108]. Though more research is needed to fully understand the effects of cannabis on sperm health and establish appropriate guidelines, the available evidence supports avoiding its use when trying to conceive. Similarly, illicit drugs, such as opioids, can affect sperm health and hormone levels and should not be used [109].

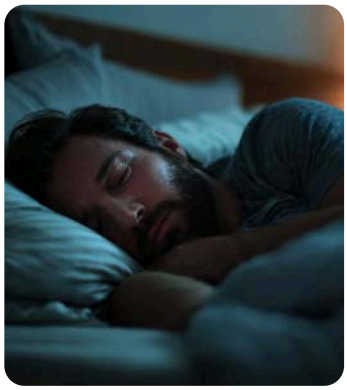
Sleep

Sleep is important for sperm health because it influences the hypothalamus-pituitary-adrenal (HPA) axis, which maintains healthy hormone levels and reproductive health [110]. However, some studies suggest there is an inverse U-shaped relationship between sleep length and semen quality [111]. This means that both too little and too much sleep could negatively affect reproductive health.

Disturbances to the circadian rhythm—which controls the sleep-wake cycle—can impair sleep quality, cause sleep deficits, and in turn, affect sperm quality [112]. Circadian rhythm disruption could occur because of simple factors, such as inconsistent sleep patterns, or more complex challenges, like frequent travel across time zones or shift work.

The following tips can help you support quality sleep:

- Adhere to a sleep routine to the best of your ability by having a regular sleep-wake schedule.
- Dim lights two hours before bed.
- Sleep in a dark room or use an eye mask.
- Use melatonin supplements like Herbatonin™ when appropriate.
- When waking at night to use the restroom, avoid turning on lights unless it is unsafe.

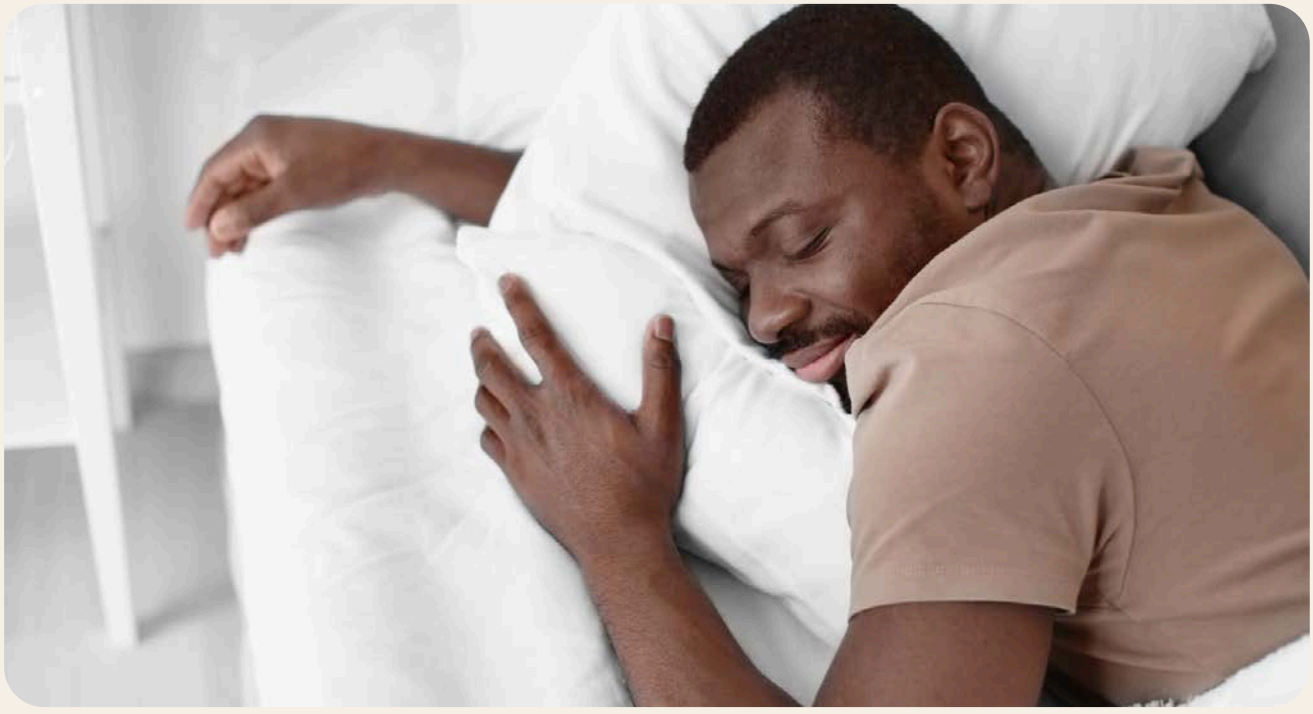


The following tips can help support shift workers:

- When possible, align your shift with your chronotype (e.g., "night owls" may fare better during night shifts).
- If you are planning to sleep after a shift, be mindful of caffeine consumption.
- Consider using melatonin on free days to support healthy sleep.
- Do not use melatonin supplements for night shifts, as it may impact your work.

Chronotype refers to an individual's preference for morning ("morning lark") and night ("night owl"). Night owls are typically more tolerant of shift work as they have later and often more flexible bedtimes compared to morning larks [113]. In fact, matching night shift work to chronotype may produce healthier melatonin rhythms and improved sleep, which may translate into better overall health. Note that recommendations may differ between permanent shift work and rotating shift work.

Though melatonin is well-known for helping you get to sleep, its antioxidant properties may help manage oxidative stress and support sperm quality [114]. In fact, melatonin is even found in seminal plasma. One study showed that phytomelatonin (melatonin from plants) demonstrated up to 950% stronger antioxidant potential compared to synthetic melatonin, which is the most common supplementation form on the market [115]. Herbatonin® 0.3 mg is a plant melatonin that may support healthy sperm, though it is recommended that you speak with your healthcare provider before adding dietary supplements to your routine.



Stress management

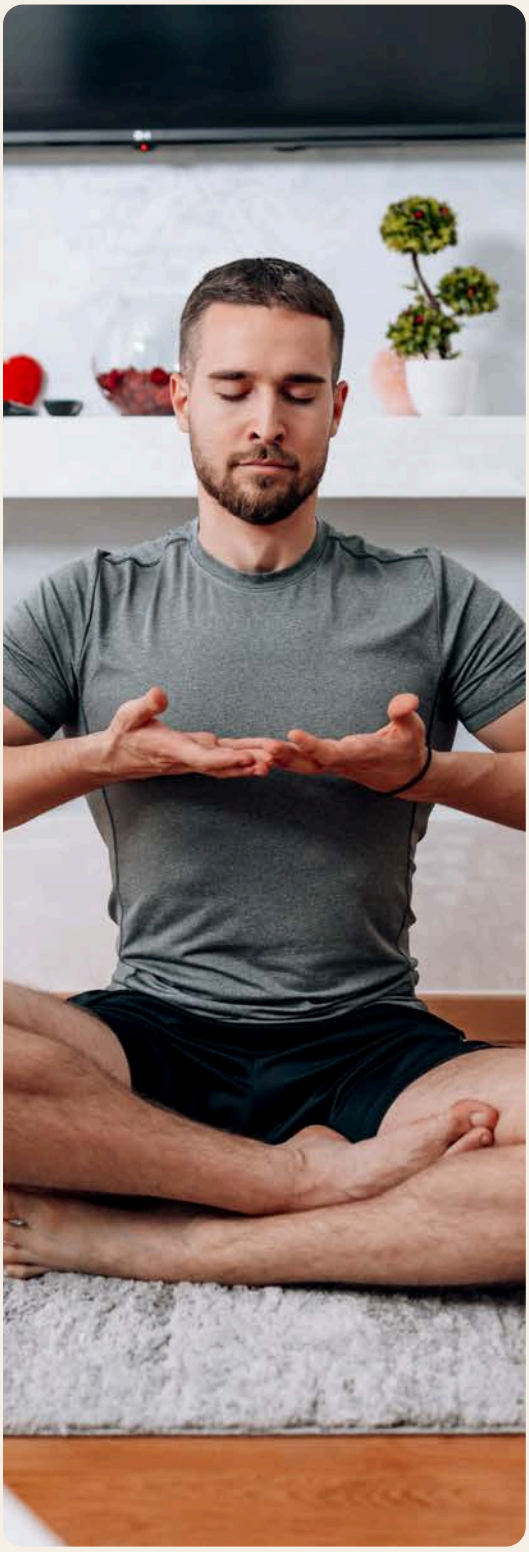
Interestingly, research shows conflicted findings regarding an association between stress and semen quality. One study found that cortisol levels were positively associated with total sperm count, and the authors suggest that high stress may even improve semen parameters [116].

On the other hand, a different study found a negative linear association between perceived stress and semen quality [117]. Importantly, the perception of stress was considered more sensitive for semen quality and testicular function compared to stress symptoms or a stressful life event in the previous three months.

Nevertheless, it cannot be denied that addressing high stress levels can improve your quality of life and make it easier to focus on other aspects of your health.

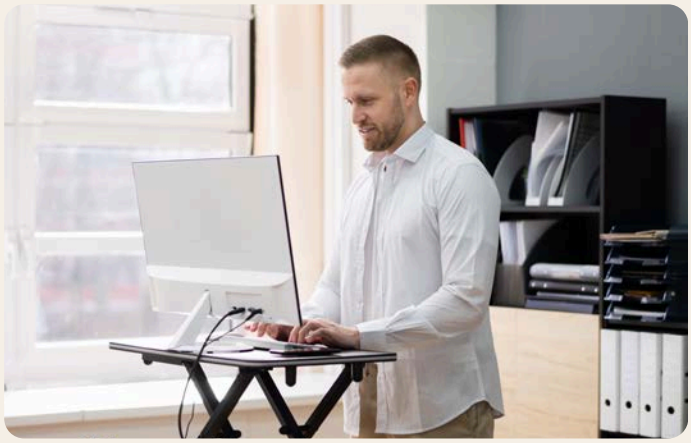
Stress management practices may include:

- Breathwork
- Drawing or doing puzzles
- Journaling
- Listening to music or playing an instrument
- Mind-body exercise, such as Pilates or tai chi
- Mindfulness or meditation
- Outdoor time, such as walking or hiking
- Reading
- Spending time with pets



Scrotal heat stress

Chronic scrotal heat stress is associated with sperm damage via increased reactive oxygen species and decreased heat shock proteins [118]. “Scrotal cooling” may support sperm quality and function. Although there is often low compliance for scrotal cooling due to discomfort, it is a non-invasive and affordable method to support male fertility [24]. On the other hand, exposure to high temperatures, such as from tight clothing, long periods of sitting whether at a desk or on a bike or motorcycle, hot baths, or sauna, may adversely affect sperm health [118,119].



Some tips to reduce scrotal heat stress:

- Wear loose-fitting clothing
- Minimize time spent in hot baths and sauna
- Spend less time sitting—if you have a desk job, consider using a standing desk
- Avoid frequent or extended periods of cycling or motorcycle riding while you prepare to conceive

Electromagnetic field radiation

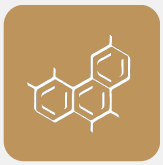
Exposure to electromagnetic field (EMF) radiation comes from Wi-Fi, Bluetooth devices, cell phones, radios, computers, radar equipment, and more. Taking steps to reduce exposure may support male reproductive health, and though the evidence is uncertain, minimizing EMF radiation may support sperm health [120]. Some practical suggestions for reducing EMF radiation exposure include keeping cell phones out of your pocket, avoiding placing laptops on your lap, and removing electronic devices from your bedroom while sleeping, aiming for at least 8 hours free from EMF radiation.

Given that exposure is inevitable, you can take protective measures by including antioxidant nutrients in your diet [121]. Research suggests that vitamin E may be particularly beneficial. This nutrient can be found in foods such as sunflower seeds, almonds, hazelnuts, peanuts, spinach, and broccoli [122]. Other potentially protective nutrients include folate and melatonin [121].

Summary

Empowerment & Knowledge

- The male partner contributes up to 50% of fertility concerns.
- Sperm are reproductive cells that carry genetic information, whereas seminal plasma is a fluid that provides nutrients and pH buffering for sperm. Together, they make semen.
- A semen analysis measures sperm count, sperm motility, sperm morphology, and semen volume, viscosity, and pH.



Hormones

- Hormones like testosterone, luteinizing hormone, and follicle-stimulating hormone play important roles in sperm health.
- Healthy insulin metabolism indirectly affects semen quality and can be supported with fiber-rich meals and daily movement.
- Revolution Macalibrium® is made from a targeted concentration of maca phenotypes. It may support healthy hormones and sperm in men.

Diet & Nutrition

- In general, a Mediterranean-style diet, emphasizing high intake of plants and healthy fats, is more supportive of sperm health than a Western-style diet, emphasizing high intake of processed foods.
- Though there are no definitive protein guidelines for sperm health, moderate protein intake appears to support healthy testosterone levels in men.
- Lycopene is a phytochemical that accumulates in the testes and may provide sperm with protection from oxidative damage.
- DHA is a type of omega-3 fatty acid important for sperm health.
- Nutrients like coenzyme Q10, folate, iron, vitamin C, and zinc can support healthy sperm.

Exercise & Movement

- Exercise regulates the HPA axis, supports healthy blood flow to reproductive organs, maintains normal levels of oxidative stress, and supports mood and the stress response.
- A healthy level of exercise for sperm health can be achieved by following the adult physical activity guidelines, with at least 150-300 minutes of moderate-intensity exercise each week, ideally spread across 3-5 days.
- Excessive exercise can contribute to oxidative stress and hormone imbalances, so it is important to be mindful of intensity and incorporate enough rest days.

Lifestyle & Environment

- Environmental toxins are found in blood, urine, and semen.
- Some toxins, such as bisphenols and PFAS or "forever chemicals," can affect hormone balance and sperm health.
- Those in certain occupations, such as firefighters, construction workers, or welders, may be exposed to toxins in their workplace.
- Sleep influences the HPA axis and may support sperm and semen health.
- Herbatonin™ 0.3 mg may support sleep and normal levels of oxidative stress for healthy sperm.
- Scrotal heat stress can be minimized by wearing loose-fitting clothing, minimizing time in hot baths or saunas, reducing the frequency or duration of activities like cycling, and spending less overall time sitting.

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NATURAL HEALTH

A Whole Health Guide to Sperm Health