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The role of Zinc in men's health

Men's health: Definition and differentiation

The term health does not describe a detailed, specifiable medical diagnosis. Since 1948, the WHO has broadly defined "health" as follows:

*"Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. (...)."*¹

Naturally, this applies to people of both sexes and all age groups.

In contrast to this, the term men's health refers to health issues that are specific to males. The Foundation for Men's Health has defined this term as follows:

*"Men's health encompasses the dimensions of health and diseases which are particularly relevant to men and boys. Health is a state of physical, psychological and social well-being (...). Protective factors are a healthy and conscientious lifestyle, accepting one's strengths but also weaknesses as a man, meaningful experience and zest for life, social support and personal recognition. (...)."*²

An adequate supply of vitamins and minerals is essential for maintaining good health. Providing the body with an adequate supply of zinc, in particular, plays a major role in maintaining and restoring a person's general health as well as specifically with regards to men's health.

General physiological effects of zinc

The critical importance of zinc for human health was first identified in 1963³. The physiological effects of zinc are many and varied. Zinc is absorbed via transcellular transport where various zinc-specific carriers are involved. At higher dosages the paracellular diffusion gains more importance. Zinc is partially lost during the physiological dequamation of the intestinal epithelium cells and has to be supplied constantly by food or food supplements. A wide range of zinc salts, e.g. Zinc L-Ascorbate, Zinc Bisglycinate, Zinc Citrate and Zinc Malate are permitted for the fortification of food as well as for the use in food supplements.

Enzymatic function

Zinc performs important functions in numerous enzymatic reactions, e.g. for the oxidation of ethanol to ethanal via alcohol dehydrogenases in the course of the breakdown of alcohol⁴. Together with copper as a regulator, zinc has an important function

in the reduction of oxidative stress via the enzyme superoxide dismutase^{3,5,6}. In addition, zinc also takes part in the transport of oxygen and carbon dioxide in the red blood cells together with the enzyme carbonic anhydrase⁴.

Wound healing

The systematic ingestion of zinc accelerates wound healing significantly. According to one study, the healing time of even larger wounds was nearly cut in half when zinc was taken (220 mg Zinc Sulfate/day, corresponds to 89 mg zinc/day)⁷.

Antimicrobial and anti-inflammatory effects

Zinc is used successfully as an antimicrobial agent in oral hygiene. Studies show that zinc significantly inhibits the growth of various types of *staphylococcus* in abscesses, for example *S. aureus*^{7,8}. Because of its antimicrobial and anti-inflammatory effects, zinc is also used against a whole range of dermatological diseases such as various forms of acne, rosacea, psoriasis, eczema and ulcerative wounds⁹. Good performing zinc salts are for example Zinc L-Pidolate or Zinc Oxide.



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Immune-stimulating and infection-reducing effects

Zinc has a positive effect on the human immune system^{10,11}. It acts as a *second messenger*¹⁰ in immune cells and shortens the duration of a cold on average of one week¹¹ by inhibiting the activity of the mRNA of pro-inflammatory cytokines^{10,12}. Zinc L-Ascorbate unifies the positive effects of zinc and vitamin C to support the immune function in one mineral salt.

Zinc in men's health

In the male body, testosterone is produced primarily in the testicles and to a lesser extent in the adrenal cortex. It is responsible for the development and maintenance of a wide range of specific male bodily functions and male behavior. A regular intake of zinc increases a man's serum testosterone level¹³ and this is the main health benefit of zinc for men.

Muscle growth

Both muscle mass and muscle strength depend on the testosterone level in the blood serum and are reduced proportionally to it when testosterone production decreases¹⁴. Therefore, providing the body with a sufficient supply of zinc can help support the maintenance and development of muscle mass.

Cartilage and bone regeneration

Even cartilage and bone density depends on the body's testosterone level. With increasing age, the bone matter of men tends to decline, which correlates to the decrease of testosterone production¹⁵. In animal studies, this was also shown to have an influence on the growth of cartilage¹⁶. In this way, an optimal supply of zinc to the body can also be helpful in building and maintaining bone density and cartilage mass.

Spermiogenesis

Testosterone is indispensable for the production of sperm and the maintenance of its

fertility^{17,18}. For this reason, young men who have yet to start a family especially profit from getting enough zinc.

Body hair and beard growth

Apart from brief fashion trends, beard growth and body hair are among some of the attractive attributes of masculinity. Testosterone, however, has a contradictory effect on masculine hair growth because a high testosterone level both promotes and inhibits it depending on the region of the body. While the growth of body, armpit, facial and pubic hair is promoted by testosterone, the hair follicles on the head shrink when the testosterone level is high, which can then lead to partial or complete baldness^{19,20}. However, undesired, hormonal-related baldness (androgenic alopecia) can be successfully treated with topical preparations that inhibit the 5 alpha reductase enzyme. This enzyme metabolizes testosterone into 5 alpha dihydrotestosterone, which is responsible for inhibiting hair growth^{20,21}.

Increasing sexual desire

A high level of testosterone significantly increases the libido, which has been demonstrated in animal studies by means of copulation frequency²². Therefore, ingesting a sufficient amount of zinc can also provide help for a hormonal-related loss of libido, e.g. as one gets older.

Drive, stamina, dominate and aggressive behavior patterns

Testosterone generally increases intrinsic male behavior: Impulsiveness, stamina, fight and risk readiness²². Certainly, testosterone also has negative effects on behavior patterns. Studies have shown that men with a high testosterone level tend to exhibit uncooperative, egocentric²³, destructive or even criminal behavior²⁴. One study of male social behavior showed that subjects with a high testosterone level are less likely to lie²⁵. The characteristics and the extent of these behavior patterns are not just subject to testosterone alone. Cortisol and serotonin also have an influence here^{23,24}.

Zinc requirement

The recommended daily intake of zinc is 10 mg for adults according to Regulation (EU) No 1169/2011²⁶.

Zinc deficiency

With a varied diet, a zinc deficiency rarely occurs in the western world⁴. However, an unbalanced diet, a high proportion of phytic acid in the diet¹², a habitual high consumption of alcohol, gastrointestinal diseases and the consumption of chelating agents such as penicillamine can cause a zinc deficiency⁴.

A moderate zinc deficiency manifests itself in an increased susceptibility to infection, skin disorders (dermatitis), hair loss and delayed wound healing⁴. A chronic, severe zinc deficiency can lead to stunted growth, hypogonadism (smaller reproductive organs), cognitive deficits, an enlarged spleen and liver, as well as geophagy (the eating of soil)²⁵. In general, a person should consult with a doctor regarding severe

symptoms before they begin taking a zinc supplement.

Sources of zinc

Fish, shellfish and crustaceans, especially oysters, contain lots of zinc. Meat and offal (liver in particular) are also good sources of zinc^{4, 26, 27}. When these sources of zinc are cut from the diet, then nutritional supplements and zinc-fortified foods provide a sufficient amount of zinc. Cereal grain products inhibit the bioavailability of zinc because they contain phytate. Milk products also inhibit the bioavailability of zinc, along with unphysiologically high amounts of iron, copper and calcium⁴.

Advantages for the man

Zinc increases the production of the hormone testosterone. Therefore, an optimal supply of zinc to a man's body can improve and maintain a man's health, and also help to support specific masculine physical and mental attributes. Due to its ability to shorten

the duration of an infection, zinc is a proven remedy against the proverbial "man flu". In principle, a strengthened immune system leads to optimal efficiency, which correlates perfectly with the generally accepted perception of a man.

Zinc can also help make last night's hangover somewhat more bearable due to its alcohol-metabolizing effect. Injuries received from men's sports (mountain biking, climbing, martial arts, etc.) heal faster with an optimum supply of zinc and bone fractures occur less often as a result of intense athletic activity. During long periods outdoors, e.g. for outdoor sports, zinc protects against the oxidative stress from sunlight and in this way, helps to maintain young, fresh skin among other things.

Male-specific diet

Providing a man's body with a sufficient supply of zinc is easy to achieve via the diet. Many foods containing zinc are seen as particularly manly: Steaks, perhaps from



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the grill, oysters, shrimp and other seafood usually find their way easily and happily onto a man's daily menu. Surprisingly, several classic masculine dishes contain a particularly large amount of zinc, e.g. the American classic surf & turf, which combines steak with lobster, or the traditional breakfast of American astronauts: steak and eggs, whose high proportion of animal proteins make it easier for the zinc to be absorbed from the beef⁴. One can only speculate about the influence of evolution on the development of these relevant preferences.

The antioxidative effect of zinc can also be optimized when the body is supplied with a sufficient amount of copper⁶. In this case, the consumption of crustaceans, for example, in combination with dark chocolate would be highly recommended. Chocolate is a good source of copper and its bioavailability is increased by the consumption of proteins⁴. An unusual combination to be sure, but one that can be achieved, for example, with grilled shrimp and a mole negra, a spicy chocolate-based sauce.

Dr. Paul Lohmann GmbH KG offers a wide range of zinc salts, e.g. Zinc L-Ascorbate, Zinc Bisglycinate, Zinc Citrate and Zinc Malate.

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