

Lycopene - description, benefits, effect on the body and the best sources

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Abstract. As a plant pigment, lycopene has pronounced antioxidant properties. Slows down cell aging, actively counteracting the development of coronary heart disease. It is found in fairly large quantities in many red vegetables and fruits.

Scientific research has shown the positive effects of lycopene on cardiovascular health, as well as its ability to reduce the risk of prostate, stomach and lung cancer.

This is interesting:

In the 90s of the twentieth century, Harvard University conducted a study of the effect of lycopene on the incidence of prostate cancer in men. During the experiment, very encouraging data were obtained. Of 50,000 men who regularly consumed tomatoes, the incidence of cancer decreased by more than 30%.

Keywords: lycopene, general characteristics, daily requirement, digestibility, beneficial properties, signs of deficiency, signs of excess

Lycopene-rich foods:

- Ketchup
- Tomato sauce
- Tomato juice [1]
- Tomatoes (especially orange) [2]
- Grapefruit [3]
- Melon [4]
- Watermelon [5]
- Carrot [6]
- Pumpkin [7]
- Red pepper [8]
- Apricot [9]
- Persimmon [10]
- Guava
- pumpkin juice
- Carrot juice [11]

General characteristics of lycopene

Lycopene is a carotenoid and plant pigment with high antioxidant [12] activity. In 1910, lycopene was isolated as a separate substance, and by 1931 its molecular structure was deduced. Today, this pigment is officially registered as a food additive under the E160d label. Lycopene belongs to the class of food colorings.

At enterprises, E160d is produced in several ways. The biotechnological method is more common. This method makes it possible to obtain lycopene from the fungi *Blakeslea trispora* by biosynthesis. In addition to the use of fungi, recombinant *Escherichia coli* is widely used for biosynthesis.

A less common method is the isolation of carotenoid pigment from vegetable crops, more specifically tomatoes. This method is more expensive on a production scale, which is why it is less common.

Lycopene is used everywhere, reaching its greatest popularity in the cosmetic and pharmaceutical industries; in addition, it is used as a fortified food additive and as a dye in the food industry. Lycopene can be purchased in pharmacies in the form of capsules, powders and tablets.

Daily requirement for lycopene

The level of lycopene consumption varies among different peoples. For example, residents of Western countries consume on average about 2 mg of lycopene per day, and residents of Poland up to 8 mg per day.

According to medical recommendations, adults need to consume 5 to 10 mg of this substance daily. Children up to 3 mg per day. To fully provide the daily norm for an adult's body, two glasses of tomato juice or eat the appropriate amount of tomatoes is enough.

Attention, long-term consumption of tomatoes in combination with starchy foods can lead to the formation of kidney stones.

The need for lycopene increases:

- with an increased risk of cardiovascular diseases (coronary heart disease [13], atherosclerosis [14]) – used for prevention and treatment in the early stages;
- if there is a predisposition to cancer of the prostate, stomach, and lungs (heredity, for example);
- in old age;
- with poor appetite;
- for inflammatory diseases (lycopene is an immunostimulant);
- for cataracts [15] (improves retinal nutrition);
- with frequent fungal diseases and bacterial infections;
- in summer (protects skin from sunburn);
- when the acid-base balance in the body is disturbed.

The need for lycopene is reduced:

- during pregnancy and breastfeeding [16,17];
- in smokers (there is a risk of free radicals due to the oxidation of lycopene);
- for cholelithiasis (may cause exacerbation);
- in case of individual intolerance to the substance.

Lycopene Absorption

The highest degree of lycopene absorption was revealed after heat treatment of lycopene-containing products. It is best accepted by the body when there is fat in the food. The maximum concentration in the blood was recorded 24 hours after a single dose, in tissues - after a month of regular use.

Research results indicate that beta-carotene promotes better absorption of lycopene (by approximately 5%). The bioavailability of lycopene is about 40%.

Beneficial properties of lycopene and its effect on the body

Prevention of cancer pathology

Based on the research conducted, world-class oncologists were able to come to this conclusion. Daily lycopene intake is inversely associated with the risk of stomach, prostate [18] and lung cancer.

Lycopene-containing products are not only a natural prevention of cancer, but also promote recovery in the early stages, which greatly facilitates therapy.

Prevention of cardiovascular diseases

Lycopene and lycopene-containing products reduce the risk of developing atherosclerosis, and also simplify the treatment of atherosclerosis in the early stages of the disease.

Prevention of ophthalmic problems

Lycopene accumulates in the retina and ciliary body. Thanks to the protective functions of lycopene, the retina of the eye maintains its integrity and productivity. In addition, being one of the most important antioxidants, lycopene reduces oxidation processes in cells and tissues.

A number of experimental studies have found a directly proportional relationship between the use of lycopene and the treatment of cataracts.

Prevention of inflammatory diseases

The results of scientific research indicate that the use of lycopene during conservative therapy in the treatment of diseases of inflammatory origin leads to rapid positive dynamics.

In addition, lycopene is used to prevent acid-base balance disorders and fungal diseases, and normalizes cholesterol [19] metabolism.

Interaction with other elements

Like any carotenoid, lycopene is well absorbed by the body along with fats. Stimulates the production of collagen [20], which reduces the likelihood of new wrinkles. By interacting with other carotenoids, it helps improve tanning, reducing the risk of negative exposure to sunlight.

Signs of lycopene deficiency in the body:

A lack of carotenoids increases the risk of developing cardiovascular disorders. The body's susceptibility to cancer increases. Frequent bacterial and fungal diseases are observed, and immunity is reduced.

Signs of excess lycopene in the body

Orange-yellow color of the skin and liver (lycopenoderma).

Factors affecting the amount of lycopene in the body

It is not synthesized in our body; it enters it with food.

Lycopene for beauty and health

Used in cosmetology to eliminate some cosmetic imperfections. Reduces skin dryness, removes excess pigmentation and wrinkles. Cosmetic masks with lycopene-containing products smooth the skin and trigger regeneration processes. They preserve the youth and elasticity of the skin and its beauty for a long time [2 1].

Literature

1. Shelestun, A., & Eliseeva, T. (2023). Tomato juice—10 scientifically proven health benefits. *Journal of Healthy Eating and Dietetics*, 2 (24), 25-30. DOI: 10.59316/j.edaplust.2023.24.4
2. Eliseeva, T., & Tkacheva, N. (2018). Tomatoes (*Solanum lycopersicum*). *Journal of Healthy Eating and Dietetics*, (3), 31-40. DOI: 10.59316/.vi3.15
3. Eliseeva, T. (2022). Grapefruit juice is a storehouse of useful vitamins and microelements. *Journal of Healthy Eating and Dietetics*, 4 (22), 34-39. DOI: 10.59316/.vi22.210
4. Eliseeva, T., & Yampolsky, A. (2020). Melon (lat. *Cucumis melo*). *Journal of Healthy Eating and Dietetics*, 3 (13), 26-37. DOI: 10.59316/.vi13.81
5. Eliseeva, T., & Tarantul, A. (2019). Watermelon (lat. *Citrullus lanatus*). *Journal of Healthy Eating and Dietetics*, 3 (9), 44-56. DOI: 10.59316/.vi9.50
6. Eliseeva, T., & Tarantul, A. (2018). Carrot (lat. *Daucus carota* subsp. *sativus*). *Journal of Healthy Eating and Dietetics*, 4 (6), 43-55. DOI: 10.59316/.vi6.31
7. Eliseeva, T., & Yampolsky, A. (2018). Pumpkin (lat. *Cucurbita*). *Journal of Healthy Eating and Dietetics*, 4 (6), 23-33. DOI: 10.59316/.vi6.29
8. Tarantul, A., & Eliseeva, T. (2020). Bell pepper (lat. *Capicum annum*). *Journal of Healthy Eating and Dietetics*, (13), 47-58. DOI: 10.59316/.vi13.83
9. Yampolsky, A., & Eliseeva, T. (2020). Apricot (lat. *Prunus armeniaca* Lin.). *Journal of Healthy Eating and Dietetics*, (12), 60-70. DOI: 10.59316/.vi12.75
10. Eliseeva, T., & Yampolsky, A. (2019). Persimmon (lat. *Diöspyros*). *Journal of Healthy Eating and Dietetics*, 4 (10), 37-50. DOI: 10.59316/.vi10.56
11. Eliseeva, T., & Tkacheva, N. (2023). Carrot juice—8 scientifically proven health benefits. *Journal of Healthy Eating and Dietetics*, 2 (24), 31-36. DOI: 10.59316/j.edaplust.2023.24.5

12. Eliseeva, T., & Tkacheva, N. (2019). Antioxidants - description, benefits, effects on the body and the best sources. *Journal of Healthy Eating and Dietetics*, (7). DOI: 10.59316/j.edpl.2018.7.12
13. Lazareva, V., & Eliseeva, T. (2021). Ischemia - signs and symptoms, useful and dangerous products, folk remedies. *Journal of Healthy Eating and Dietetics*, (16). DOI: 10.59316/j.edpl.2021.16.43
14. Lazareva, V., & Eliseeva, T. (2021). Atherosclerosis - signs and symptoms, useful and dangerous products, folk remedies. *Journal of Healthy Eating and Dietetics*, (15). DOI: 10.59316/j.edpl.2021.15.47
15. Lazareva, V., & Eliseeva, T. (2021). Cataracts - signs and symptoms, useful and dangerous products, folk remedies. *Journal of Healthy Eating and Dietetics*, (16). DOI: 10.59316/j.edpl.2021.16.46
16. Eliseeva, T., & Tkacheva, N. (2020). Food during pregnancy. *Journal of Healthy Eating and Dietetics*, (11). DOI: 10.59316/j.edpl.2020.11.24
17. Tkacheva, N., & Eliseeva, T. (2020). Food for a nursing mother. *Journal of Healthy Eating and Dietetics*, (11). DOI: 10.59316/j.edpl.2020.11.25
18. Lazareva, V., & Eliseeva, T. (2022). Prostatitis - signs and symptoms, useful and dangerous foods, folk remedies. *Journal of Healthy Eating and Dietetics*, (19). DOI: 10.59316/j.edpl.2022.19.18
19. Tkacheva, N., & Eliseeva, T. (2019). Cholesterol – description, benefits, effects on the body and the best sources. *Journal of Healthy Eating and Dietetics*, (8). DOI: 10.59316/j.edpl.2019.8.16
20. Tkacheva, N., & Eliseeva, T. (2021). Food for collagen production. *Journal of Healthy Eating and Dietetics*, 3 (17), 70-75. DOI: 10.59316/vi17.127
21. Tkacheva, N., & Eliseeva, T. (2021). Food for the skin - 12 products for its beauty and health. *Journal of Healthy Eating and Dietetics*, 3 (17), 44-48. DOI: 10.59316/vi17.121

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