

# Cho-less-terin

Code: FE1838 – 90 softgels



CHO-LESS-TERIN is a natural product for the control of cholesterol. This formula contains red yeast extract, guggul lipids, beta-glucans, green tea extract and plant sterols in a highly bioavailable matrix of extra virgin olive oil. Sixteen studies including 590 people with high cholesterol have shown that plant sterols alone can reduce total cholesterol by an average of 10%, and LDL (low-density lipoprotein) by 15%. The combination of the active ingredients of CHO-LESS-TERIN can reduce total cholesterol by up to 50%.

This formula is safe, effective and free of the side-effects of statins. Our synergetic formula reduces the production of LDL cholesterol, which is dangerous to the liver, by interfering with intestinal absorption of LDL cholesterol and inhibiting cholesterol oxidation, which leads to atherosclerosis (hardening of the arteries).

CHO-LESS-TERIN is also safe for coadjuvant use with medicines prescribed for hypercholesterolemia.

**Ingredients:** Extra virgin olive oil (*Olea europea*), guggul resin (*Commiphora wightii*), plant sterols (0,8 g per recommended daily dose), **oat** (*Avena sativa*), green tea extract (*Camellia sinensis*), red yeast rice (*Monascus purpureus*), sunflower-lecithine (gelling agent), thickener: beeswax, annatto extract (*Bixa orellana*), anticaking agent: silicon dioxide, softgel (glazing agent: gelatin; humectants: purified water and glycerol).

Nutritional information:	4 softgels (8 120 mg)	Size and format:
Guggul (3,5% guggulsterone)	1 400 mg	90 softgels
Plant sterols	800 mg	
<i>beta</i> -Sitosterol	320 mg	
Campesterol	160 mg	
Stigmasterol	160 mg	
Oat (22% <i>beta</i> -glucans)	600 mg	
Green tea (50% polyphenol) (8 mg EGCG / softgel)	320 mg	
Red yeast rice (0,5% monacolin K, 1 mg) (0,25 mg / softgel)	200 mg	
Extra virgin olive oil	2 334 mg	

## Recommended daily dose:

2 softgels twice daily with food. Do not exceed the stated recommended daily dose (4 softgels). The consumption of more than 3 g/day of plant sterols supplements, 3 mg/day of monacolin from red yeast rice or 800 mg EGCG/day or more should be avoided.

## Indications and uses:

Different studies have shown that the natural components of CHO-LESS-TERIN can help reduce total cholesterol, LDL cholesterol, and the HDL/LDL ratio. As a consequence, it can reduce the risk of cardiovascular diseases such as cardiac insufficiency, atherosclerosis and cerebrovascular accidents.

## Cautions:

This product is not intended for people who do not need to control their blood cholesterol level. Should not be used by pregnant or lactating women, children below 18 and adults above 70 years of age, if you are already using other products containing green tea, or on empty stomach. If you experience any health problems, consult your doctor about the use of this product. Do not take if you are taking cholesterol-lowering medication. Do not take if you are using other products containing fermented rice with red yeast. This product is to be used as part of a balanced and varied diet, including regular consumption of fruit and vegetables to help maintain carotenoid levels.

**GUGGUL:** This is the name of the yellow gum resin of the myrrh tree *Commiphora wightii*, found in India and Arabia. The E and Z isomers of guggulsterones are the active components of the resin, and effective antagonists of the nuclear hormone receptor activated by bile acids, called *fernesoid X* (FXR), also a transcription factor that regulates the expression of genes involved in the maintenance of bile acid homeostasis, allowing for increased catabolism and cholesterol excretion<sup>(1,2,3)</sup>. The resin extracts of the guggul tree noticeably decrease LDL cholesterol and triglycerides<sup>(4,5)</sup>.

**SOY PLANT STEROLS:** CHO-LESS-TERIN contains a mixture of plant sterols (alcohols commonly found in plants-phytosterols), beta-sitosterols, campesterol and stigmasterol. Since these are chemically very similar to cholesterol, they're located in places where this fat passes from the intestine to the blood, blocking its absorption and thereby decreasing blood cholesterol.

They can also reduce treatment for atherosclerosis and ulcers, inhibit breast tumours and benign prostatic hyperplasia and modulate the immune system. As a consequence, they can be valuable for reducing the risk of cardiovascular diseases such as cardiac insufficiency, atherosclerosis and cerebrovascular accidents<sup>(7)</sup>.

**Beta-sitosterols:** A sterol capable of reducing both total cholesterol and LDL cholesterol without affecting HDL (high density lipoprotein). Its activity reduces cholesterol absorption in the intestine by around 50%. This mechanism of action leads to greater LDL cholesterol excretion and a lower circulation in the bloodstream<sup>(6)</sup>.

**Campesterol:** A sterol with an affinity for LDL cholesterol, capable of reducing serum levels by up to 10%<sup>(7)</sup>.

**Stigmasterol:** An effective sterol for decreasing plasma cholesterol levels, inhibiting intestinal absorption of cholesterol and suppressing hepatic cholesterol and bile acid synthesis<sup>(8)</sup>.

**OAT:** Its main component is soluble fibre (beta-glucan) which is absorbed safely through the digestive tract without entering the bloodstream. Beta-glucan forms a viscous solution in the stomach which travels through the intestines, binding to bile acids, consuming higher amounts of LDL without damaging HDL cholesterol levels<sup>(9,10)</sup>. It's a simple, yet very effective natural cholesterol inhibitor<sup>(10)</sup>.

**GREEN TEA:** Polyphenols, specifically the catechins in green tea are important antioxidants that protect LDL cholesterol from oxidation, limiting its absorption in the intestines and preventing atherosclerosis<sup>(11,12)</sup>. Different studies have confirmed that green tea extracts outperform even vitamin C in preventing LDL cholesterol oxidation<sup>(12,13)</sup>.

**RED RICE YEAST:** is traditionally prepared through a fermentation method in which the rice serves as a growth culture for the yeast *Monascus purpureus*. During the fermentation process, the typical red color is produced, which has been used for thousands of years in Asian cooking as a spice and food colourant<sup>(14)</sup>.

This natural food inhibits HMG-CoA reductase (hydroxymethylglutaryl coenzyme A reductase), one of the key steps of cholesterol synthesis, inhibiting biosynthesis to both prevent cholesterol absorption from food intake and increase the elimination of circulating cholesterol<sup>(15)</sup>.

Different studies have shown it to be a safe and effective way to reduce total cholesterol and LDL cholesterol, the LDL/HDL ratio and the severity of atherosclerosis<sup>(15,16)</sup>.

**EXTRA VIRGIN OLIVE OIL:** CHO-LESS-TERIN is formulated in a matrix of extra virgin olive oil, a natural source of vitamins A, D, E and K. As an antioxidant-rich source, it holds benefits for cholesterol control and for cardiovascular health and helps in cardio-vascular protection<sup>(17)</sup>. Its phenolic content can account for further benefits on HDL cholesterol levels and oxidative damage in addition to those from its monosaturated fatty acid content<sup>(18-20)</sup>.

## References:

- 1) Urizar N.L., Moore, D. (2003). GUGULIPID: A Natural Cholesterol-Lowering Agent. *Annual Review of Nutrition*, 23 (1), 303–313.
- 2) Anurekha, J., & Gupta, V. B. (2006). Chemistry and pharmacological profile of Guggul: A review. *Indian Journal of Traditional Knowledge*, 5(4), 478-483.
- 3) Zhu, N., Rafi, M. M., DiPaola, R. S., Xin, J., Chin, C. K., Badmaev, V., ... & Ho, C. T. (2001). Bioactive constituents from gum guggul (*Commiphora wightii*). *Phytochemistry*, 56(7), 723-727.
- 4) Deng, R. (2007). Therapeutic effects of guggul and its constituent guggulsterone: cardiovascular benefits. *Cardiovascular drug reviews*, 25(4), 375-390.
- 5) Satyavati, G. V. (1988). Gum guggul (*Commiphora mukul*)—the success story of an ancient insight leading to a modern discovery. *The Indian journal of medical research*, 87, 327-335.
- 6) Jones, P. J., Raeini-Sarjaz, M., Ntanos, F. Y., Vanstone, C. A., Feng, J. Y., & Parsons, W. E. (2000). Modulation of plasma lipid levels and cholesterol kinetics by phytosterol versus phytostanol esters. *Journal of Lipid Research*, 41(5), 697-705.
- 7) Ito, N., Hakamata, H., & Kusu, F. (2010). Simultaneous determination of  $\beta$ -sitosterol, campesterol, stigmasterol, and brassicasterol in serum by high-performance liquid chromatography with electrochemical detection. *Analytical Methods*, 2(2), 174-179.
- 8) Batta, A. K., Xu, G., Honda, A., Miyazaki, T., & Salen, G. (2006). Stigmasterol reduces plasma cholesterol levels and inhibits hepatic synthesis and intestinal absorption in the rat. *Metabolism*, 55(3), 292-299.
- 9) Braaten, J. T., Wood, P. J., Scott, F. W., Wolynetz, M. S., Lowe, M. K., Bradley-White, P., & Collins, M. W. (1994). Oat beta-glucan reduces blood cholesterol concentration in hypercholesterolemic subjects. *European Journal of Clinical Nutrition*, 48(7), 465-474.
- 10) Queenan, K. M., Stewart, M. L., Smith, K. N., Thomas, W., Fulcher, R. G., & Slavin, J. L. (2007). Concentrated oat  $\beta$ -glucan, a fermentable fiber, lowers serum cholesterol in hypercholesterolemic adults in a randomized controlled trial. *Nutrition Journal*, 6(1), 1.
- 11) Kono, S., Shintchi, K., Ikeda, N., Yanai, F., & Imanishi, K. (1992). Green tea consumption and serum lipid profiles: a cross-sectional study in northern Kyushu, Japan. *Preventive medicine*, 21(4), 526-531.
- 12) Sagesaka-Mitane, Y., Miwa, M., & Okada, S. (1990). Platelet aggregation inhibitors in hot water extract of green tea. *Chemical & pharmaceutical bulletin*, 38(3), 790-793.
- 13) Stensvold, I., Tverdal, A., Solvoll, K., & Foss, O. P. (1992). Tea consumption. Relationship to cholesterol, blood pressure, and coronary and total mortality. *Preventive medicine*, 21(4), 546-553.
- 14) Heber, D., Yip, I., Ashley, J. M., Elashoff, D. A., Elashoff, R. M., & Go, V. L. W. (1999). Cholesterol-lowering effects of a proprietary Chinese red-yeast-rice dietary supplement. *The American journal of clinical nutrition*, 69(2), 231-236.
- 15) Wei, W., Li, C., Wang, Y., Su, H., Zhu, J., & Kritchevsky, D. (2003). Hypolipidemic and anti-atherogenic effects of long-term Cholestin (*Monascus purpureus*-fermented rice, red yeast rice) in cholesterol fed rabbits. *The Journal of nutritional biochemistry*, 14(6), 314-318.
- 16) Li, C., Zhu, Y., Wang, Y., Zhu, J. S., Chang, J., & Kritchevsky, D. (1998). *Monascus purpureus*-fermented rice (red yeast rice): a natural food product that lowers blood cholesterol in animal models of hypercholesterolemia. *Nutrition Research*, 18(1), 71-81.
- 17) Rink, C., Christoforidis, G., Khanna, S., Peterson, L., Patel, Y., Khanna, S., ... & Sen, C. K. (2011). Tocotrienol vitamin E protects against preclinical canine ischemic stroke by inducing arteriogenesis. *Journal of Cerebral Blood Flow & Metabolism*, 31(11), 2218-2230.
- 18) Khandouzi, Nafiseh, Ali Zahedmehr, and Javad Nasrollahzadeh. "Effect of extra-virgin olive oil on lipid profile and inflammatory biomarkers in patients undergoing coronary angiography: a randomized, controlled, clinical trial." (2020).
- 19) Covas, María-Isabel, et al. "The effect of polyphenols in olive oil on heart disease risk factors: a randomized trial." *Annals of internal medicine* 145.5 (2006): 333-341.
- 20) Tsartsou, Evangelia, et al. "Network meta-analysis of metabolic effects of olive-oil in humans shows the importance of olive oil consumption with moderate polyphenol levels as part of the mediterranean diet." *Frontiers in nutrition* 6 (2019): 6.