



Scientific Evidence of BellaVie CHOLESTEROL

The CHOLESTEROL Synbiotic from Bellavie is a broad-spectrum, high-CFU, multispecies probiotic supplement containing 5 probiotic microbial species, prebiotic, and supplement, each selected for well-documented supportive health benefits.

The formula has been developed with essential intestinal bacteria to support a more favorable balance of intestinal microbiota and improve the cholesterol level. The formula is completed with prebiotics and nutraceuticals which are working in synergy with probiotics and enhance their activity.

Background

Total cholesterol is a total measure of the fats found in the blood, which include high-density lipoprotein* (HDL) cholesterol, low-density lipoprotein (LDL) cholesterol, and triglycerides.

Cholesterol is needed in the body for maintenance and regulation of normal function. But too much cholesterol can pose a problem. A desirable level of total cholesterol in the blood is less than 200 mg/dL. Cholesterol can be synthesized in the liver or obtained through dietary sources such as animal based foods or tropical oils which can be high in saturated or trans fats.

Factors contributing to the buildup of total cholesterol include large amounts of low-density lipoprotein, insufficient levels of high-density lipoprotein and high amounts of triglycerides within the diet which ultimately increases the likelihood of cardiovascular diseases.

Probiotics and Cholesterol

There are numerous reports on cholesterol removal ability of probiotics and their hypocholesterolemic effects. Cardiovascular and coronary artery disease risk are correlated with cholesterol levels and are significant health concerns. Current cholesterol-lowering approaches include lifestyle and diet modifications, as well as statins which presents numerous shortcomings. Conversely, probiotics represent an interesting and less restrictive strategy to fight against hypercholesterolemia or excess cholesterol.

The mechanism of cholesterol reduction by probiotics is suggested as:

- Deconjugation of bile salt by the bile salt hydrolase (BSH) enzyme and subsequent co-precipitation of cholesterol at acidic pH
- Binding of cholesterol to probiotic cellular surface and incorporation into their cell membrane to prevent excess absorption,
- Mechanistically, probiotic bacteria ferment food-derived indigestible carbohydrates to produce short-chain fatty acids in the gut, which can then cause a decrease in the systemic levels of blood lipids by inhibiting hepatic cholesterol synthesis and/or redistributing cholesterol from plasma to the liver.

- Production of compounds that inhibit enzymes responsible for the absorption of cholesterol such as 3-hydroxy-3-methylglutaryl coenzyme A,
- Cholesterol conversion to coprostanol.

Thus, supplementation with probiotics that interfere with cholesterol metabolism may lower the risks of cardiovascular and coronary heart disease and therefore contribute to disease prevention.

Bellavie IMMUNO Capsule Composition

Each Bellavie capsule contains a symbiotic element (Probiotic and Prebiotic) along with a nutraceutical element to give the overall term ‘synbioceutical’. Within the probiotic element within the capsule, there are 5 specially selected microorganisms chosen based on scientific evidence outlining their many health benefits.

For the prebiotic element of the capsule, inulin from chicory is used based on its ability to stimulate growth and give a synergistic effect to the probiotics.

For the nutraceutical element of the capsule, pine phytosterol is used for its well-documented benefit in lowering cholesterol and cardiovascular risk.

Probiotics

Each probiotic contained within the Bellavie CHOLESTEROL capsule is based on scientific research that demonstrates how each probiotic makes a positive impact on cardiovascular health. The following facts about each probiotic has been backed up by extensive research and clinical trials.

- ***Bacillus coagulans***
 - The use of *Bacillus Coagulans* in the formulation of functional foods and supplements for reducing total cholesterol and supporting the cardiovascular system (1).
 - Oral *Lactobacillus sporogenes* therapy may prove to be an important hypolipidemic therapy (2).
- ***Lactobacilli***
 - Treatment with a synbiotic formula of *L. Plantarum*, *L. Acidophilus* and *L. Reuteri* with active prebiotics decreased several cardiovascular risk factors in elderly patients (3).
 - Overall, milk fermented with *L. Acidophilus* had a hypocholesterolemic effect, especially in subjects with lipidemic status of borderline cholesterol level (2.0-2.2 g/l) (4).
 - *L. Gasseri* and inulin reduced plasma total cholesterol and low-density lipoprotein cholesterol via alteration of lipid transporters in hypercholesterolemic subjects (5).

- *L. Reuteri* capsules may be useful as an adjunctive therapy for treating hypercholesterolemia (6).
- Consuming probiotic lactobacillus, especially *L. Reuteri* and *L. Plantarum*, could reduce total cholesterol and ldl-c significantly (7).
- *T. Plantarum* has beneficial effects in lowering cholesterol levels, especially in patients with higher levels of cholesterol (8).
- *Lactobacillus plantarum* is a well-tolerated, natural probiotic, that may be used as an alternative or supplement to existing treatments to reduce cardiovascular risk (9).

Prebiotic

Prebiotics are needed to provide nutrients to create an optimal environment and support the growth of the probiotics. Inulin was chosen as the prebiotic for this capsule as inulin increases the number of good bacteria in the gut, particularly bifidobacterial and lactobacilli.

The fibre in inulin is soluble, which means it dissolves in water and in the stomach and forms a gelatinous substance. Some of the functions of inulin include:

- Facilitates & slows digestion which enables the body to better absorb nutrients from the food.
- Helps modulate the immune system.
- Reduces cholesterol absorption as it passes through the digestive tract.
- Provides the body with nutrients and active elements.
- Facilitates the absorption of calcium and magnesium.
- Can be fermented into lactate and short chain fatty acids which impact the way energy is metabolised in the body and provides a protective effect against metabolic diseases and obesity.

Clinical studies have proven the following about inulin:

- Daily consumption of soymilk containing 2 g of phytosterols, and 10 g of inulin reduced tc and ldl-c better than standard soymilk (10).
- Inulin-enriched pasta administration induced significant effects on lipid pattern parameters in young healthy volunteers, including a significant reduction in lipoprotein(a) concentrations (11).
- The oral inulin administration reduced total cholesterol, low density lipoprotein cholesterol, very low-density lipoprotein and trygliceride levels in dyslipidemic and obese subjects (12).

- The present study showed that synbiotic supplementation containing inulin and *L. acidophilus* can confer a number of health benefits including improvements in tg, total cholesterol, ldl-c, body weight, stress, anxiety, and depression to subjects that are overweight or obesity (13).

Nutraceutical

Nutraceuticals are natural health supplements recognized for their effects on targeted functions. The Bellavie CHOLESTEROL cap contains pine phytosterol as it is known for the beneficial roles that it plays in lowering cholesterol and cardiovascular risk.

- The intake of a low-fat spread with added plant sterols reduces low-density lipoproteins cholesterol in hypercholesterolemic and healthy subjects.

Pine Phytosterols are known to:

- Prevents the absorption of cholesterol by occupying its absorption sites in the intestine.
- Reduces LDL ("bad") cholesterol levels by 10% to 14%, with no adverse effects.
- Prevents cardiovascular diseases

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