

PROBIOTIC STRAINS WITH HYPOCHOLESTEROLEMIC ACTIVITY AS POTENTIAL BASIS OF FOOD SUPPLEMENT FOR PREVENTION AND CONCOMITANT TREATMENT OF CARDIOVASCULAR DISEASES ASSOCIATED WITH HIGH CHOLESTEROL LEVEL

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Globally, about 17 million people die from cardiovascular disease (CVD) every year, accounting for 31% of all deaths worldwide. High serum cholesterol is regarded by many as the main cause of coronary atherosclerosis, and it has been well established that elevated cholesterol is associated with an increased risk of CVD. Apart from modulating the gut functionality, probiotics have also been associated with various other health benefits such as brain functioning, boosting immunity, reducing cholesterol, and promoting metabolic homeostasis through their biological mechanisms in the body.

Several mechanisms of involvement of the microbiome in maintaining lipid metabolism at a physiological level and preventing the development of hypercholesterolemia are assumed: deconjugation of bile acids and reduction of their resorption due to the synthesis of specialized hydrolases; incorporation of cholesterol into the lipid layer of the cell membrane; transformation of cholesterol into coprostanol and its removal from the body together with feces; inhibition of cholesterol synthesis in the liver.

The aim of the study was to establish the cholesterase activity *in vitro* and *in vivo* of previously selected highly probiotic strains of lactic acid bacteria (LAB) for the further creation on their basis of a line of effective food supplements. The objects of the study were five LAB strains deposited in the depository of the Zabolotny Institute of Microbiology and Virology, NAS of Ukraine and patented.

Experimental results showed that *Lactobacillus acidophilus* IMV B-7279 and *Bifidobacterium bifidum* VK-1, as well as composition *B.bifidum* VK-1:*B.longum* VK-2 (1:1) were the most effective probiotics *in vivo*. Cholesterol-lowering activity of all studied probiotic strains and their compositions ranged 40-78%. At the same time, also the cholesterase activity of the other studied strains was not lower, and in some cases even higher than that of most of the drugs currently used in cholesterinosis. It should be noted, all hypocholesterolemic drugs are rather expensive and have a number of side

effects, the main of which is hepatotoxicity. The probiotic strains are completely free of these negative side effects and are not addictive.

The obtained results allow us to assert that it is necessary to develop a line of food supplements and probiotics, based on the studied strains and their compositions in encapsulated form (which will increase the survival of probiotic microorganisms when passing through the upper gastrointestinal tract, which will indirectly increase the therapeutic effect of such drugs and products), for prevention and treatment of diseases associated with the negative manifestations of high cholesterol levels. Probiotics that contain cholesterol-assimilating strains can efficiently complete the complex therapy of CVD, cancer etc.