

Attempts are being made worldwide to control civilization-related diseases. However, the common ground of many diseases is poor diet. Very often we consume food rich in n-6 fatty acids, but poor in n-3 fatty acids. Both groups of these fatty acids are very important for the body. N-6 acids have the ability to lower LDL cholesterol, eicosapentaenoic and docosahexaenoic acids belonging to the n-3 group play an especially important role in the prevention of cardiac, neurological and autoimmune diseases. They are the building blocks of the brain and affect the proper functioning of the eye. They are responsible for eicosanoid metabolism, they reduce heart rate and blood pressure and are important components of membranes in the retina and brain tissue. Unfortunately, the human body is unable to produce polyunsaturated n-3 and n-6 fatty acids. It is impossible to synthesize the unsaturated bond at n-3 and n-6 positions (at the 3rd and 6th carbon atom). Therefore, we must provide these acids in the diet. However, the ratio of n-6 to n-3 fatty acids in the diet is very important. It is recommended that the ratio is as low as possible, preferably 2:1. This is important because excessive consumption of n-6 acids interferes with the metabolism of n-3 acids and impedes the physiological balance of the compounds which are synthesized from these fatty acids. This means that these very important compounds are not synthesized in the case of an inadequate diet rich in n-6 fatty acids and low in n-3 acids. When the duration of n-3 acid deficit is extended, then it leads to the development of various diseases, especially cardiovascular diseases. This fact was confirmed when tests were carried out both in Denmark and Greenland [Simopoulos, 2002]. The diets of both nations and the number of people suffering from cardiac disease were compared, demonstrating a significantly lower incidence of cardiac disease in Greenland, which was associated with the consumption of large quantities of marine organisms, due to geographical conditions.

The main sources of polyunsaturated n-3 fatty acids are of course, fish and seafood, followed by oils and algae. However, some people do not like fish. In some countries, their popularity is low, and the prices are very high, which determines the low interest among consumers. Therefore, to examine the possibility of a mould *Galactomyces geotrichum* to produce n-3 acids is a very important research task.

Strains of *Galactomyces geotrichum* have been isolated from fried cottage cheese. Completed preliminary studies have shown the ability of the mould to produce extracellular n-3 fatty acids. For this reason the aim of the research is to understand the capacity to produce n-3 fatty acids under the changed culture conditions.

Basic research will involve carrying out a number of cultures in various combinations, both components of the medium and the culture conditions to determine the best combination of selected factors for the production of n-3 fatty acids. By analyzing proteins in both cell biomass and the supernatant from the culture it will be attempted to create a probable scheme of fatty acid production.

Simopoulos A.R. (2002) Omega-3 fatty acids in inflammation and autoimmune diseases. *Journal of the American College of Nutrition*, 21, 495-505