

Nanostructure and multifunctional properties of butter with red beet cryopowder

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Resume : Nowadays whole world comes to prophylactic medicine. 70 % of all diseases bound up with nutrition. In recent years scientific direction of using bioactive compounds for prevention and treatment has developed rapidly. Nutritious vegetable substances have a lot of micronutrients with various preventive and therapeutic mechanisms, while synthetic mount has only one component. Butter is widely used product. We developed butter with red beet cryopowder (RBC). Scanning electron microscopy researches showed butter is a nanocrystall material with complex heterosystem. Addition of RBC change nanostructure of butter essentially, reduce the elements of its structure by 5-25 times in nanoscopic range. Selforganization of nanostructure was founded. Cellular nanostructure is formed with size of cellules - 60-100 nm. Mechanism of selforganization was suggested. Nanodrops of water phase and nanobumps arise in the beginning. They form the multiflat nanocrystall with nanodrops of water (8-16 nm) on edges and peaks. The fractal display is observed in nanostructure of nanocrystall. According to the results of complex researches change of butter nanostructure improves its structure and consistency, inhibits both microbiological and oxidative processes, which increase biological value and functional properties. According to the results of biomedical tests and conclusions of Ministry of Health of Ukraine butter with RBC is recommended to use for preventive and therapeutic nutrition for multifunctional biomedical application. It has bracing and immune modulating properties. Butter is recommended to use in environment with toxins and radionuclides, and also on cardiovascular diseases and some types of anemia. Aforesaid shows perspective to use RBC for butter nanostructure and functional properties management. Research shows butter is a nanoprodukt.