The impact of cryogenic “shock” freezing and non-enzymatic catalysis on destruction of inulin-proteic nanocomplexes to their monomers (fructose and aminoacids) is studied during the obtaining of nanopuree from topinambour. It is determined that due to the mentioned processes the significant portion (45–55%) of these insoluble and hardly digestible substances is destructed and transformed to the soluble, easily digested form.

It was found that with the comprehensive effect on topinambour from cryogenic “shock” freezing and finely dispersed grinding, there occurs activation of sparingly soluble inactive forms of pectins and their fuller extraction from nanocomplexes with other biopolymers by 3,0–3,4 times, including protopectin by 2 times larger than in the original raw material, which is controlled by traditional chemical methods and soluble pectin forms by 4,5 times more. In general, 70% of pectins in the nanopowders and nanopuree are in soluble form. The mechanism of this process is linked with the non-fermentative biocatalysis – cryomechanalysis.

It was found that assimilation of nanosupplements (nanopuree and nanopowders) from topinambour is 2,7–3 times higher than the original raw material, which is determined by using the biotesting method of the test-cultures of ciliates (one-cell by generative activity) that is connected with peculiarities of chemical composition of the additives, BAS content and dispersed state. A significant part of the substances (60–70%) is in the nanosoluble form.

With the use of nanosupplements, various kinds of health foods were developed (dry instantly soluble fruit nanodrinks “Instant”, dry juices (including for special purposes), confectionery, new kinds of nanoicecream, biokefirs and bioyogurts with prebiotic properties etc.).

**Keywords:** cryogenic “shock” freezing, non-enzymatic catalysis, mechanodestruction, topinambour, inulin-proteic nanocomplexes, nanopuree.