

## INVESTIGATION OF THE EFFECT DRIED FOOD PRODUCTS ON THE PROPERTIES OF THE BUTTER MIXTURE DURING STORAGE

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### Abstract

In recent years, there has been a general trend in the world to increase the consumption of low-fat dairy products. Butter mixtures are quite popular food products for daily consumption, as evidenced by the significant volume of their industrial production. The aim of work was to investigate the effect of dried food products on the properties of the butter mixture during storage.

To meet the needs of consumers, technology has been developed for the production of an butter mixture using dried food products - tomato and carrot powder and pre-dispersed sesame seeds. The butter mixture was stored at temperatures  $t = 0 - 8^{\circ}\text{C}$  during 8 days. Changes occurring in the fat phase of butter mixtures were studied by differential scanning calorimetry. The resulting melting endotherms, which are generalized crystal phase melting curves, were decomposed by the least-squares method into Gaussians using the program PeakFit, using the regularities of the normal distribution of Gaussian curves. X-ray diffraction analysis of the butter mixture was determined by a diffractometer type DRON-3M in CuK $\alpha$  radiation. The protein content was determined by the Kjeldahl method, the organic acids by the gas-liquid chromatography method, the iron and beta-carotene - by the colorimetric method. The content of minerals - potassium and sodium - by ionometry method, calcium and magnesium - by complexometric method, phosphorus - by photometric method. Microbiological studies were performed by methods of determination: quantity of mesophilic aerobic and facultative anaerobic microorganisms, CFU/g; *Escherichia coli* in 0.001 g; *Staphylococcus aureus* in 1 g, *Listeria monocytogenes* and *Salmonella* in 25 g, as well as yeasts, and molds, CFU/g.

X-ray diffraction analysis revealed the intensification of recrystallization and differentiation of groups of low-melting and medium-melting glycerides in the crystalline fat phase of the enriched butter mixture as early as 3 days of its storage due to the components of plant additives. The optimized combination of ingredients allows to ensure the quality of the butter mixture for 8 days of storage in the following conditions:  $t = 0 - 8^{\circ}\text{C}$  and 75% relative humidity. In terms of nutritional value, there is an increase in protein by 3.5 times, organic acids by 4.5 times, beta-carotene by 2.6 times, the daily human need for sodium, potassium, and iron by 40 %, magnesium, calcium, and phosphorus from 15 to 30% is provided. Microbiological studies have proven that the butter mixture enriched with dried food products and sesame seeds is characterized by purity during the specified storage.

According to the intensity of accumulation of free acids and peroxides, resistance to oxidation of the butter mixture during storage is proved. Incubation of the oxidative transformation of lipids of butter and sesame seeds due to the antioxidants of plant additives is shown.

**Key words:** *Butter mixture, Dried food products, Storage, Fat phase, Melting endoderm, Nutritional value, Microbiological stability, Functional numbers.*