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Nanostructure and functional properties of dairy butter with herbal food supplements

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Abstract

We have developed the range of dairy butter with natural food substances of plant origin, namely pectin and inulin biopolymers, freeze-drying and cold spray powder from black currant buds, red beets, carrots and flax seeds (the latter contain polyunsaturated fatty acids omega-3). All kinds of butter have delicate taste and have got high organoleptic evaluation. The aim of the research is to study the effect of herbal food supplements on nanostructure and butter properties formation. Using the method of electron scanning microscopy butter nanostructure creation is studied. To investigate the performance and consistency of butter structure standard techniques are used.

Butter capacity to maintain its shape at high temperatures was defined by 30º C heat stability test. The ability of butter to retain liquid fat structure was measured at 25 º C, and the hardness of butter samples was detected with the help of penetrometer by analysing the dive depth of 60 º feed angle cone. Comprehensive studies have shown that the introduction of herbal supplements has a multifunctional effect. It adds therapeutic and prophylactic properties to butter, affects the formation and self-organization of its nanostructure, and reduces the structural elements in 5-25 times. Their quantity is in 1-100 nm nanometer range.

The complex mechanism of butter fat phase braking, which is based on herbal supplements antioxidant properties and its nanostructure features, was offered.

The mechanism of butter nanostructure formation and self-organization, which is based on phase transitions and fractionation of butter fat stage glycerides, was also suggested in the article.