

## INFLUENCE OF DIETARY SUPPLEMENT BASED ON HEME IRON ON DOUGH PROPERTIES AND QUALITY OF ANTIANEMIC CUPCAKES

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### Abstract

Providing the diet of all segments of the population with sufficient organic iron is an urgent problem today. The work aims to study the effect of a dietary supplement based on heme iron on the properties of gluten, dough, and the quality of antianemic cupcakes.

Test samples of prescription compositions of cupcakes were obtained by co-administration of a dietary supplement with ferrous iron ("Redham" from the blood of slaughter animals) and esters of citric acid, mono-, and di-glycerides of fatty acids. The content of gluten in the test samples, its elasticity, elongation, hydration ability was determined by the mechanical method. The microstructure of the study objects was determined by microscopy. The viscosity of the dough was measured on a rotary viscometer with a controlled shear rate, the value of which depends on the speed and the size of the gap between the cylinders, in one of which was placed the test samples. The strength of adhesion of model samples of the test was investigated on the device of Boris Nikolaev, where the force of separation, attributed to the contact area, is realized. The alkalinity of the cupcakes was determined by acid titration, the specific volume of the cupcakes - by measuring the volume of bulk filler extruded by the product, and then dividing the volume of the product by its weight. The process of hardening of cupcakes was controlled by changing the structural and mechanical properties of the crumb, determined using a penetrometer AP-4/1, and its brittleness. Given the daily requirement of an adult in iron, we created prototypes of cupcakes with the introduction of dietary supplement "Redham" in the amount of 4, and 6% of the total mass.

The addition of "Redham" to cupcakes deteriorate the rheological properties of gluten, dough and contributes to the production of finished products in a reduced volume, with a too dense crumb, less resistant to hardening. To improve the quality of cupcakes with a mass fraction of "Redham" with 4 and 6%, we used citric acid esters, and mono- and diglycerides of fatty acids, which were pre-mixed with a dietary powder additive. As a result, the value of the brittleness index in the samples increased by 1.48 and 1.44 times, respectively, the total deformation of the crumb after 7 days of storage - by 1.1 and 1.2 times, respectively, and the specific volume of products increases by 1.1 times.

Obtained flour confectionery products characterized by the content of ferrous iron can be recommended for mass (4% "Redham" content), and therapeutic and prophylactic (6% "Redham" content) consumption, which should be confirmed with a further clinical studies.

**Key words:** Flour confectionery, Dietary supplement, Ferrous iron, Surfactant, Quality and safety indicators.