

THE NEW FUNCTIONAL PRODUCT WITH BUCKWHEAT

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Abstract

The research of a possibility of using buckwheat flour for production of a quality and safe functional drink was conducted. Also, the aim of this research was to provide information about the influence of composition of a new functional product with buckwheat on its viscosity.

The materials used for work were: skim milk, production ferment on kefiric fungi, buckwheat flour (1-5%), and fructose (1 - 5%). For improvement of consistence and durability of the product during storage the following types of stabilizers were studied: QNA-stabilizer, VB-3 stabilizer, and chitosan. Shearing rate in samples of the functional product was defined by a rotational viscosimeter Fungilab SMART of the R series using a metering device of R2. The operating principle of a viscosimeter is based on measurement of change in a torque of the metering device created by the studied sample. According to the received values of shearing rates and effective viscosity the dependence between these indexes was determined. This dependence was described by the following degree equation: $\eta_{\text{eff}} = K \cdot \dot{\gamma}^{-m}$, where η_{eff} - effective viscosity, MPa·s; $\dot{\gamma}$ - shearing rate, r/min, K - coefficient of consistence, the value of which is equal to the value of dynamic viscosity received with $\dot{\gamma} = 1$, r/min., m - speed of structure destruction. The index of effective viscosity in samples which was not less than 1000 mPa·s became the criterion for selection of the stabilizer. Organoleptic estimation was carried out according to GOST (the state standard) ISO 13299-2015 by the method of organoleptic profile.

The fermented milk product was developed by souring of skim milk with ferment on kefiric fungi, the operating temperature was $(22 \pm 2)^\circ\text{C}$ and the processing time was 10 - 12 hour. The ageing process of production ferment on kefiric fungi began after the souring process. The operating temperature of the ageing process was $(12...14)^\circ\text{C}$ and the processing time was 12 hour. As a result of performance measurement of rheological properties of samples, which contained various doses buckwheat flour (1 - 5%), the recommended dose of buckwheat flour made 2 - 3% of the mass of skim milk. It is necessary to use stabilizers for prevention of settling of flour sediment in the process of production and storage of the product also it was established. The dose of fructose equal to 2% was chosen following the results of organoleptic assessment of the product through adding different doses of fructose. The sample with chitosan had higher viscosity in comparison with other samples of the product.

The closest indexes of effective viscosity to the expected result were received in the samples containing 2 - 3% of buckwheat flour, that's why this dose was recommended. Developed compounding of the functional product with buckwheat based on skim milk includes 2 - 3% of buckwheat flour, 2% of fructose, 0.2% of chitosan and 3 - 5% of ferment on kefiric fungi.

Key words: Functional product, Buckwheat flour, Ferment on kefiric fungi, Chitosan, Shearing rate, Effective viscosity.