

Impact of Mushroom Puree and Onion Powder on Baking Processes and Protracted Cookies Preservation

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Introduction. An important direction of the development of confectionery industry is the development of products of functional purpose which could provide the required amount of nutrients in the human diet. A promising way of creating products of nutritional and functional purpose is to enrich the existing products with biologically active substances using unconventional raw materials. A good target for the enrichment is protracted cookies, as they have a balanced chemical composition of proteins, fats and carbohydrates. The replacement of formula quantity of water into mushroom puree in protracted cookies has been conducted to create a new kind of cookies and, their enrichment with flavonoids by adding dried onion in the form of powder has been done to obtain functional properties. The aim is to determine the impact of new raw materials on baking processes and preservation of protracted cookies.

Materials and methods. The objects of research are protracted cookies and dough which is used for their preparation. The forms of water linking in the tested samples are determined by the method of thermogravimetric analysis with the device "Derivatograph Q-1500D" by the change in the rate of moisture removal and the values of thermal effects. The investigation of sorption-desorption properties of protracted cookies are carried out with the sorption-vacuum apparatus of Mak-Ben.

Results. Several samples of cookies are used to conduct research: the first sample is control (on water), the second sample – puree of champignons is added into dough, the third sample – oyster puree is added, the fourth sample – oyster puree and onion powder are added. Based on the analysis it has been found that the addition of mushroom puree and onion powder to dough significantly affects the amount of free and associate moisture. Since dough with the addition of mushroom puree and onion powder contains the greatest amount of inherent moisture from all samples. The test sample is prepared with water (control) contained 60% free moisture content, since it contains in its composition mushrooms and onions. Increasing the number of water-related can be explained by the presence of strong forms of communication moisture in samples other than the control, in particular the moisture can be retained due to dietary fibre, which is introduced into dough with mushrooms and onions and able to firmly bind free moisture. It is also observed an increase in the activation energy of the samples other than the reference, which also indicates the emergence of stronger forms of communication moisture in dough after adding to the recipe the mushroom puree and onion powder.

In order to predict the effects of mushroom puree and onion powder to the terms and conditions of storage of protracted cookies the sorption-desorption processes that occur in the protracted cookies were investigated. It was found out that when $\varphi = 75\%$ water absorption capacity cookies supplemented with of mushroom puree and onion powder is 18%.

Conclusions. During storage of cookies, the rate of removal of moisture in the finished product will depend on the form of connection of moisture in the dough. The content of free and bound water in the test semi finished also affects the heat treatment process. Increasing the number of bound moisture in the cookie makes it necessary to increase the terms of heat treatment cookies. For long cookies, which during storage are able to absorb moisture, high sorption capacity has a negative impact on product quality and shelf life, so it is advisable to carry out the product packaging.