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GLUTEN-FREE CUPCAKE “LENTIS STOLICHNY” (КЕКС «СТОЛИЧНЫЙ ЧЕЧЕВИЧНЫЙ» – ВИРІБ БЕЗ ГЛЮТЕНУ)

Currently, products that don't contain gluten- proteins (gluten-free) become more and more popular. The main reasons for the increase in demand for gluten-free products are adherence to the doctors recommendations of patients with celiac disease and other types of gluten intolerance unrelated to autoimmune disorders, as well as a new trend of healthy nutrition that came from America and Europe to Russia. Abroad, population contains from 10 to 20% followers of such diet. The production of such goods is now reasonably called one of the dynamic segments of grain processing products market. However, the removal of wheat and other grains from the diet results in exclusion of a rather good protein source, so alternative sources of raw materials shouldn't reduce the nutritional value of final product. Flour proteins have a decisive role in the water-absorbing capacity of the dough, its cohesiveness and viscosity, as well as the affected organoleptic characteristics. Therefore new raw materials should facilitate the production of products that meet the requirements of consumers by sensory characteristics. One of the raw materials that meet these requirements can be seeds of leguminous crops.

The purpose of this work is to develop technologies and expand the assortment of gluten-free flour confectionery products. Lentil was examined as a wheat flour substitute component, it contains a high amount of protein (up to 27%), dietary fiber (up to 31%), and various bioactive compounds. However, legumes contain antinutrients such as trypsin inhibitors, lectins, etc. The lentil flour usage without sufficient heat treatment is hazardous to health.

The classic cupcake "Stolichny" was chosen as the initial recipe in order to expand the range of flour confectionery products using non-traditional raw materials. A portion of the wheat flour was replaced with processed lentil flour in an amount of 25, 50, 75, 100% (Fig.).

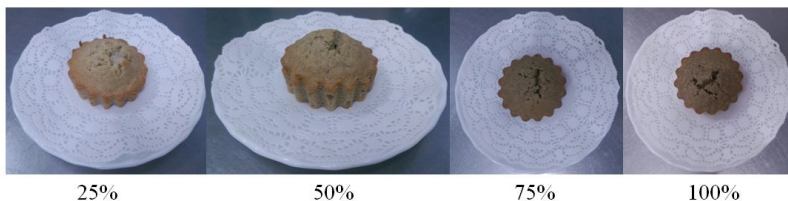


Fig. Cupcake “Lentis stolichny” with processed lentil flour in an amount of 25, 50, 75, 100% replaced of the wheat flour

The organoleptic quality evaluation of cupcakes with lentils showed that all the samples had a light brown color and conformed to the ones from original raw material, had no foreign smell, the texture was crumbly, soft, and their appearance was homogeneous with regular shape. When wheat flour had totally been substituted with processed lentil flour, the product displayed a slight nutty flavour and smell. All products had high scores by organoleptic indicators – 4,3–4,8. The highest points were for the products with 100% lentil flour content. It’s important to note that the complete replacement of wheat flour gave the opportunity to expand the assortment of gluten-free flour confectionery products.

The developed cupcake "Lentils Stolichny" was made using a nonstandard and unusual ingredient for this group of products and is innovative, therefore the consumer quality assessment using a 9-point hedonic scale was carried out. The product was evaluated in terms of appearance, taste, smell and texture. The highest score was obtained by the indicator "taste" – 8.3 points. The average score of the consumer assessment was 7.9 points, which indicated a high degree of desirability among consumers. It should be noted that there was no percentage of undesirability in the developed product.

In comparison with wheat, lentils has a higher content of protein, dietary fiber, vitamins B1, B4, B9, it’s rich in iron and manganese. The change in the receipt of the cupcake "Stolichny" by replacing wheat flour by lentil one resulted in the product enrichment with dietary fiber (in 1.4 times) and proteins (in 1.5 times), with a higher content of macro- and microelements, the food efficiency ratio increased from 9.2 to 15.6.

Thus, the developed cupcake "Lentils Stolichny" allowed to expand the assortment of protein- and fiber-enriched flour confectionery for people with gluten intolerance. Despite the fact that lentil is unusual raw material for such kind products, the consumer assessment of developed cupcakes showed a high degree of desirability and the absence of negative estimates for organoleptic indicators.