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### **THE EFFECT OF WHEAT BRAN ON BREAD QUALITY IN THE EFFICIENT USE OF SECONDARY RAW MATERIALS OF THE FOOD INDUSTRY**

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#### **Abstract**

Today's consumers increasingly demand products of high nutritional value, in particular products with a high dietary fibre content. It is well known that dietary fibres, including cellulose, are present in bran in considerable amounts. In addition, bran contains proteins, B-group vitamins, minerals and biologically active substances that have a beneficial effect on human health. For this reason, bran helps to give bread and bakery products preventive (functional) properties. However, adding bran in excessive amounts may adversely affect the structure and volume of the bread. Furthermore, microorganisms may be introduced into the dough and the finished product together with the bran, causing the bread to spoil rapidly. Therefore, studying the effect of bran on bread quality and on its storage is one of the pressing issues in the field.

The study examined the effect of various types of wheat bran on the quality of bread made from wheat flour. Premium-grade wheat flour of the M54-28 brand was used in the experiments, together with ordinary (not additionally processed), ground and extruded wheat bran produced by different manufacturers in the Russian Federation. According to the formulation, the amount of each type of bran accounted for 10 % of the total mass of the flour products. The extruded bran



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was ground beforehand. The bread dough was prepared by the straight-dough (non-sponge) method. The parameters of dough preparation and of the subsequent technological processes were maintained in accordance with generally accepted requirements [1].

The results of the study showed that, in comparison with the control sample, i.e. bread without added bran, the addition of bran to the formulation reduces the elasticity of the crumb, increases its crumbliness, lowers the specific volume, the shape-retention capacity and the porosity of the bread, and raises its acidity. This effect was most pronounced in the sample containing ordinary bran.

The effect of the various types of bran on bread quality during storage was also studied. The baked bread was stored in polymer bags under laboratory conditions for 5 days. In all bread samples containing bran, a considerable deterioration of the crumb properties was recorded in comparison with the control sample, namely a decrease in elasticity and an increase in crumbliness.

In addition, it was established that the bread samples containing ordinary and ground bran underwent microbiological spoilage more rapidly. In particular, mould appeared in the control sample and in the sample containing extruded bran on the fifth day of storage, whereas in the bread samples with ordinary and ground bran it was observed on the fourth day.

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