QUANTITY AND QUALITY OF GLUMINATE IN THE COMPOSITE MIXTURE

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Abstract: The quantity and quality of gluten in a composite mixture of local wheat, buckwheat, and soy flour significantly influence the technological processes of food products. In this study, the content of gluten in various composite flour mixtures and its influence on elasticity, ductility, and structural properties are studied. Based on the obtained results, optimal ratios are determined, which serve to improve product quality and technological processes. The research results also contribute to improving the consumer properties of products based on composite flour.

Keywords: Composite mixture, gluten content, gluten quality, elasticity, ductility, structural properties, technological process, optimal ratios, product quality, consumer properties.

"Gluten is one of the main structural components of pasta dough, determining its main technological properties - plasticity, fluidity, and extensibility."

The rheological behavior of pasta dough is determined by its structural and mechanical properties. The quantity and quality of gluten proteins significantly influence the water absorption capacity of flour, dough formation, and the ability to retain carbon dioxide. Gluten plays a crucial role in determining the rheological properties of dough, or the "strength" of flour.

The quantity and quality of crude gluten obtained from wheat flour and a composite mixture were studied. The obtained results are presented in Figures 1, 2, and 3.

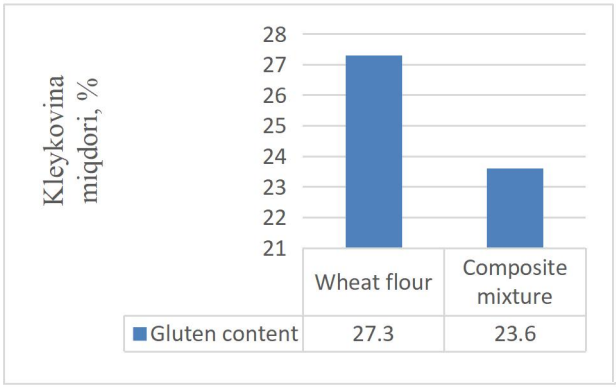


Figure 1. Gluten content of dough made from wheat flour and a composite mixture

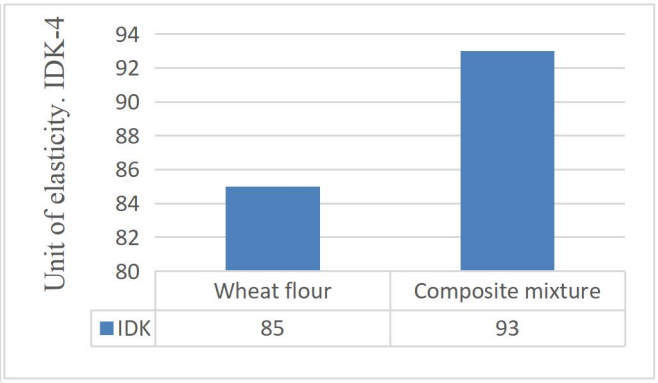


Figure 2. Gluten quality of dough made from wheat flour and a composite mixture

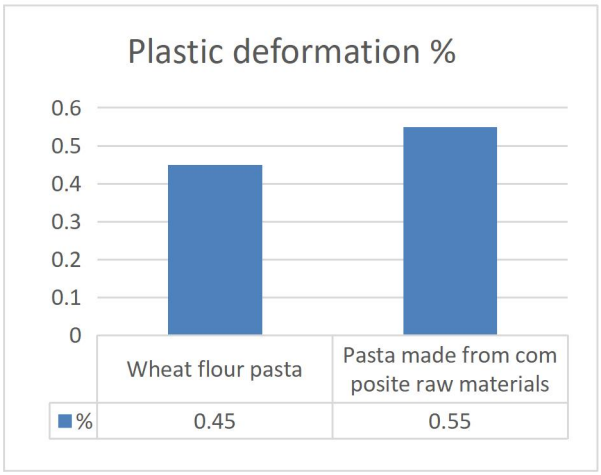
As can be seen from Figure 1, the mass fraction of gluten made from the composite mixture is 18.8% less than that of wheat. "The decrease in gluten content occurred due to the low content of gluten and gleadin in the proteins of buckwheat and soybeans."

Using the method described in Chapter 2, the elasticity and plasticity of composite pasta products were determined on a structurometer (mode 1). The research data are presented in Figure 4.2.

- Mode 1: Elastic deformations - Determining the movement value H1 and recovery after load H2 at a load value of F=50 g with initial force F0=10 g, table movement speed V=30 mm/min, final force F=150 g.

- Mode 5: Study of deformation kinetics - initial force F0=10 g, continuing until the table's movement is completely exhausted, recording on the indicator the force of division 0 and the value of the sample's movement.

In this mode, all stages of the sample from movement to stopping are studied. That is, the force is applied, the sample is deformed, then the force is removed, and the motion of the sample continues until it stops.



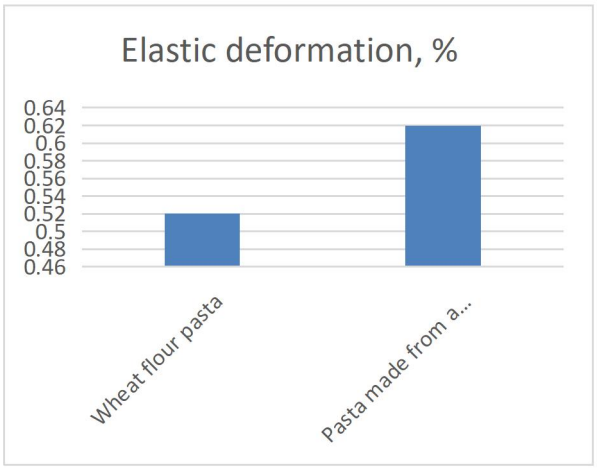


Figure 3. Plastic and elastic deformation of baked pasta

As can be seen from Figure 4.2, the plastic deformation index of products made from a composite mixture was 0.55%, which is 35% higher than the plastic deformation index of products made from wheat flour.

In products with a composite mixture, the elastic deformation index, characterizing the ability to restore its original shape upon removal of the load, is 17% lower than in products made from wheat flour.

The obtained data on the rheological properties of baked pasta were compared with the indicators of the relaxation period of the pasta dough. The change in the rheological properties of baked pasta made from a composite mixture is associated with an increase in their plastic properties and a decrease in deformation. These changes occur mainly due to the properties of proteins obtained from soybeans, since these proteins (albumins and globulins) are characterized by the presence of less water-soluble proteins than wheat flour.

LIST OF REFERENCES USED

Karimov A., Mirzayev S. Technology of Pasta Products. - Тошкент, 2022.

Nizamov B., Rakhmonov A. Innovative Technologies for the Food Industry. - Тошкент: Иқтисодиёт, 2021.

Yusupov U. Modern methods of pasta production. - Тошкент, 2021.

Abdullaev H. Technology of Processed Grain Products. - Tashkent: University, 2023.

Food Science & Technology International – Dough Mixing and Pressing Conditions in Pasta Production, 2022.

Journal of Cereal Science – Influence of Composite Flour on Pasta Dough Properties, 2023.

Scopus Indexed: Food Engineering & Processing – Optimization of Pasta Processing Parameters, 2022.

Springer: Journal of Food Science and Technology – Technological Advances in Pasta Production, 2023.