



## **STUDY OF THE MIXING TIME AND PRESSING RATE OF PASTURE DOUGH MADE FROM A COMPOSITE MIXTURE**

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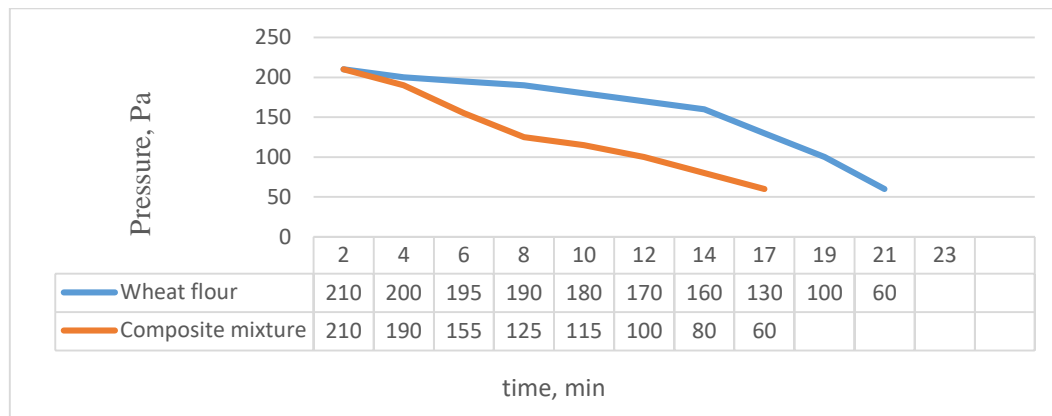
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**Abstract:** This work is aimed at studying the mixing time and pressing speed of composite pasta made from local soft wheat flour, soybeans, and buckwheat. During the research, the influence of various mixing and pressing conditions on the physicochemical properties of the dough is analyzed. Based on the obtained results, optimal parameters are determined. This makes it possible to improve product quality, effectively organize the production process, and ensure energy efficiency. It also serves to determine the role of innovative technologies in pasta production.

**Keywords:** Composite mixture, pasta dough, mixing time, pressing speed, physicochemical properties, optimal parameters, product quality, energy efficiency, innovative technologies, production process.

The phenomenon of relaxation is closely related to the structural and mechanical properties of the processed semi-finished product, and its formation often occurs under the influence of external pressure. This phenomenon is of great importance in the process of forming food materials by various methods. By knowing the characteristics of the product, it is possible to choose the optimal time and impact force for effective management of the technological process.

"The elastic and plastic properties of dough determine the relaxation process," that is, dough formation ensures the reduction and balancing of internal stresses arising as a result of mixing deformation. The longer the relaxation process, the more pronounced the stretch properties of the dough mass. The relaxation time of pasta made from a composite mixture was studied using a structurometer.

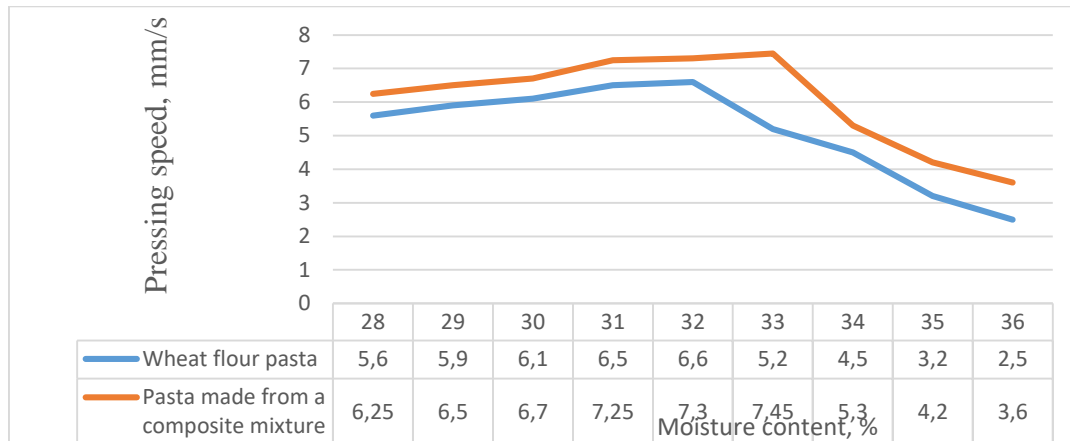


**Figure 1. Relaxation time of dough made from wheat flour and composite mixture.**

During the study, it was established that the relaxation time of the dough made from the composite mixture is 16-18 minutes, which is 20% less than in the control sample. This result indicates the high plasticity of the dough made from the composite mixture. Lysine also plays a significant role in reducing dough mixing time. In this composite mixture, an increase in the amino acid lysine by 19% is also an important factor.

The lysine molecule has the ability to interact with water molecules. This ensures even distribution of water during dough mixing and improves the dough structure. As a result, the dough will be faster and have the same elasticity. Lysine, reacting with proteins, contributes to the faster formation of the gluten network. This ensures that the pasta dough is elastic and sticky to each other, accelerating the dough kneading process.

The chemical properties of lysine contribute to the rapid strengthening of the dough. This process allows for faster product formation while simplifying the cooking and drying processes. The addition of lysine protein not only improves the quality of pasta dough, but also accelerates the process and increases efficiency. These properties make lysine protein an important component in pasta production technology. To study the influence of the moisture content of the dough prepared from the composite mixture on the efficiency of the pasta press, the pressing speed of pasta products was determined.



**Figure 2. Influence of dough moisture on pasta pressing speed.**

The pressing speed depends on the plastic properties of the dough and the pressure level. With an increase in the moisture content and temperature of the dough, the pressing speed also increases, but this is observed up to a certain moisture content, i.e., up to 33%, i.e., when the moisture content of pasta dough exceeds 33%, a sharp decrease in the pressing speed is observed. As can be seen from Figure 2, "the pressing speed of pasta made from a composite mixture at a moisture content of 30.0-31.0% was 10-10.8% higher than that of pasta made from wheat flour." This allows us to draw such a conclusion. "increasing the speed of product pressing makes it possible to increase the production volume of screw pasta presses."

If the moisture level increases further, the dough becomes coarse and difficult to pass through the outlet of the screw chamber. For drying raw products with high moisture content, more heat is consumed, therefore it is advisable to increase the production volume of the press by increasing the dough temperature.

Another way to increase the production volume of pressing is to increase the pressure level, which can be achieved by increasing the power of the electric motor (but this weighs the presses and leads to higher electricity consumption).

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