

RHEOLOGY OF WHEAT DOUGH

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The formation of the rheological properties of wheat dough begins with mixing wheat flour and other necessary components with water. Kneading dough is an important primary procedure important to bakery products, which obtain a homogeneous mass as a system of disparate components and secondly the formation of this mass with specific physical and chemical properties that provide the optimum flow for stages of manufacturing bakery products.

Direct operational indicators show the rheological behavior of wheat dough during mixing, which is also the amount of torque being applied to drive mixers or the amount of active power consumed by electric mixers bodies.

When dough goes through the hydration stage of flour and the formation of a monodisperse system, then a polydisperse system (water-soluble proteins, gluten protein, starch, pentosans, cellulose, etc.) and the formation of a first koagulation structure due to coalescence of elements of a polydisperse system, and further its background, the crystallization structure through the formation of bifilar helices (secondary superstructure) gluten protein (due to hydrogen bonds), education space micellar structures and the formation of gluten skeleton (due to hydrophobic interaction), the strength of which is due to "cross-linking" of biopolymer molecules in aggregates (by covalent disulfide bonds, and metal ions).

With further mixing in a homogeneous viscous medium, which is a grid of gluten, which are interspersed with starch grains, yeast cells, trubistye particles, droplets of free water, etc. the formation of capillary-porous structure due to the capture, retention and distribution throughout the volume of test air and plasticization test structure due to alternation in its local areas and different types of deformation: compression, tension, torsion, shear and bending, caused by the rotation of mixers.

During mixing, stresses reduce the strength of the gluten framework and ultimately lead to its destruction. Increase in torque or the development of the test structure is terminated in an extreme point of change of torque on the drive mixers' bodies. This extremum is a measure of readiness for the test batch.

After kneading, the dough is regarded as a dispersed system consisting of solid, liquid and gaseous phases with specific rheological properties.

When controlling the rheological properties of wheat dough should be taken into account a large number of technological factors, starting with the baking properties of raw materials and ending the regime of mixing. All this must be done within the framework. We have developed a parametric model with the use of certain information-measuring systems to measure the rheological properties of wheat dough in the mixing and after the operation dough.

In order to create an adequate assessment of rheological behavior of wheat dough, you must know the technological properties of raw materials, and at least the baking properties of flour and have an idea on how much they differ from the established critical points.