

DETERMINATION OF RHEOLOGICAL PROPERTIES OF CRACKER DOUGH DURING ROLL MILLING

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Elastic and plastic properties of cracker dough are achieved by means of special operations of forming dough pieces. Low temperature of dough mixing and its impermanence are limit the gluten swelling and permit to get plastic dough with low moisture. Normal structure of finished cracker depends on forming of crowd thin layers in each of dough pieces, which are can form and separate during backing. This process need to optimize dough plastication study. The goal of this research was the development of method of controlling dough rheological properties during roll milling.

Elastic modulus and strength of finished crackers was determined with “Structurometr ST-1M” device. Online control of rheological properties changing in dough during roll milling was based on measurement of torque on rolls drive. To showing up the changing of rheological properties in dough proteolytic enzyme was applied. It is made the gluten structure less strong, but created the more plastic dough.

The effect of proteolytic enzyme on average torque on rolls drive during repeated plastication shown on Fig. 1.

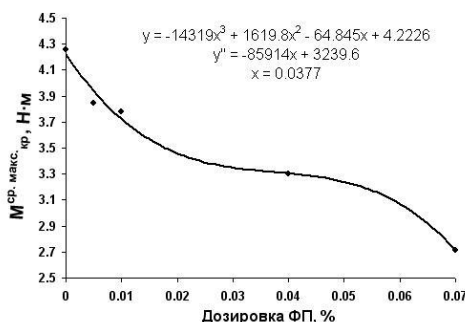
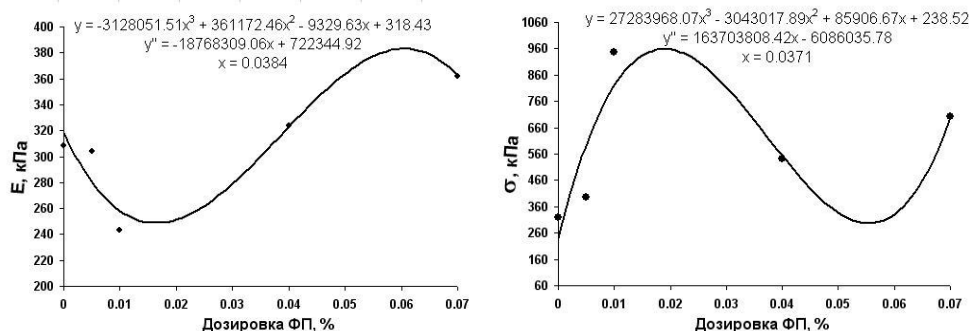


Fig. 1 The changing of average torque on rolls drive at different amount of enzyme.

If we are will describe this curve with equation of third order, then we can mark tipping point, which are corresponding to 0.04 % of enzyme. Follows research showed with this amount of enzyme the best quality of finished cracker according to physical-chemical and organoleptic properties. We can conclude that with this amount of enzyme special boundary rheological properties were formed.

The effect of proteolytic enzyme on elastic modulus and strength of finished crackers are shown on Fig. 2, 3.



As shown in Figures 2, 3 on this curves also is possible to mark tipping point, which are corresponding to 0.04 % of enzyme. These conditions confirm the need to finding special boundary rheological properties of dough and finished crackers.

Research showed, that with online measurement of torque on rolls drive is possible to make conclusion about changing of rheological properties in dough during rolls milling. It could be actual, for example, when different types of flour with different meaning of gluten quality are used in process.