

Effect of transglutaminase on quality parameters of gluten-free buckwheat bread

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Abstract

High-quality gluten-free bread is in great demand these days. At the same time, the production of such bread presents many difficulties. It is necessary to use substances that will replace the role of gluten. Research is still being conducted on alternative variants of gluten-free bread.

The aim of the study was to determine the effect of transglutaminase (TG) on the quality characteristics of buckwheat bread. The effectiveness of the enzyme in the presource of buckwheat sourdough and in a dough supplemented with whey protein was also tested.

The buckwheat flour used in the research is a good environment for transglutaminase. It has been shown that doses of 5 and 10U TG/ 100g of flour mixture improve the appearance and porous structure of the crumb. The specific volume was higher than the control and the sample with the highest dose used (15U TG/100g of flour mixture). A decrease in total baking loss and slower drying of the crumb was observed. The best quality improvement effects were obtained for the bread variant containing 5U of transglutaminase per 100g of the flour mixture.

Enzyme efficiency in sourdough bread was demonstrated by increasing the specific volume and improving the appearance of the loaf. The protein network was clearly strengthened, which translated into better stability of the pores in the crumb structure. The use of gluten-free buckwheat sourdough improved aroma of the tested bread. The characteristic bitterness of buckwheat was masked. A variant containing 5U TG/ 100g of flour mixture and 30% sourdough was distinguished.

Whey protein in reaction with TG significantly increase the amount of protein agglomerates. Supplementation of buckwheat dough with 3% whey protein resulted in a better appearance, crumb texture and aroma of the tested bread.

The research on the effectiveness of transglutaminase allowed for the development of new recipes for gluten-free buckwheat bread, which is an alternative to conventional bread.