

Sodium chloride substitution in industrial white slice diary bread

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Abstract

Introduction. The effect of sodium chloride replacement was studied in industrial white slice diary bread, promoting a technological approach to decrease the sodium content from bakery products in order to respond to the World Health Organization's recommendation to reduce dietary salt intake.

Materials and methods. Granolife CV Sustisal 100 (GCVS100) was evaluated as sodium chloride substitute analyzing the dough fermentative properties by Rheofermentometer, and the dough behaviour properties on mixing–heating–cooling by Mixolab. Additionally, loaf specific volume and texture profile were considered as baking quality parameters.

Results and discussion. The addition of GCVS100 or NaCl to wheat flour dough led to decrease gas production during fermentation stage. However, they significantly increased the coefficient of gas retention, promoting the improvement of the gluten network and allowing to get a dough development curve similar to dough flour. Additionally, both ingredients changed several flour dough parameters in Mixolab. Water absorption was decreased, dough stability was prolonged, gelatinization process (C3-C2) was reduced, stability of the starch gel when heated (C4- C3) was improved and retrogradation of the starch was increased. GCVS100 assessed in WSDB formula showed similar effects than NaCl. The addition of GCVS100 or NaCl to WSDB caused reduction of gas production during fermentation. Meanwhile, the coefficient of gas retention did not show significant differences between the treatments, due to WSDB formulation include compounds promoter of strengthening of the gluten structure of the dough that masked NaCl and GCVS100 effect. In this way, NaCl and GCVS100 led to decrease dough development according to less gas production. WSDB baking parameters revealed that bread loaf specific volume was significantly higher for WSDB without NaCl or GCVS100, in agreement with fermentation results. Texture profile analysis of WSDB did not showed changes in crumb firmness and springiness when NaCl or GCVS100 is added.

Conclusions. The addition of GCVS100 in WSDB caused a similar effect to NaCl. The results of the present study suggest that GCVS100 exhibits a potential use to obtain sodium-free WSDB.

Keywords: Bread Sodium chloride Rheology Mixolab Texture