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The effect of refined salt concentration on the rheological properties of wheat dough

Efectul concentrației de sare rafinată asupra proprietăților reologice ale aluatului de grâu

Bread is one of the oldest and most widely consumed food products, playing an essential role in the daily diet of the population. Bakery products are recognized as one of the main sources of sodium in the diet, particularly in countries where bread consumption is high. Salt performs essential technological functions in the bread-making process, influencing the sensory characteristics of the final product. The aim of this study was to evaluate the rheological properties of dough samples prepared from high-quality wheat flour with different concentrations of refined salt (0–1.6% relative to flour weight) during extension. Wheat dough extension was analyzed using an Alveograph (Chopin Technologies, Cedex, France) according to ICC Standard No. 121. The following parameters were determined: maximum pressure, extensibility, swelling index, baking strength, and the configuration ratio of the Alveograph curve (P/L). The results demonstrated that salt addition led to a decrease in the swelling index, with optimal values maintained at salt levels of 0.4–0.8%. It was observed that salt addition strengthened the gluten network of the dough, increasing dough resistance by 22.1% and deformation energy by 30.4%, while reducing dough extensibility by 27.2%. The improving effect of salt on the rheological properties of the dough can be explained by its dehydrating action on gluten: the amount of osmotically bound water decreased, and the gluten structure became more compact and resistant. Furthermore, the addition of salt to wheat flour dough samples resulted

in an increase in the P/L ratio. Thus, moderate salt addition enhances dough rheological behavior and technological quality, highlighting the importance of optimizing salt concentration in bread-making formulations to achieve desirable processing characteristics while considering nutritional implications related to sodium intake.

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