The International Conference "Biotechnologies, Present and Perspectives" Suceava, Romania

10th Edition,
17-19 October 2025

Section 3.
Food Products Quality and Safety

THE INFLUENCE OF COCOA POWDER ON THE QUALITY OF WHEAT BREAD

Anna HRYSHCHENKO
Department of Bakery and Confectionery Goods Technologies,
National University of Food Technologies, Ukraine
grischenko_anna@ukr.net

Abstract: One of the main goals of bakery manufacturers is to develop new products that have good taste and an attractive appearance. Along with developing new flavors, the nutritional and energy value of the products should be considered for improvement. A promising approach is the use of cocoa bean byproducts, which not only have a unique flavor but also contain many beneficial substances. Numerous recipes for cookies, gingerbread, and cakes contain cocoa powder. Products with cocoa powder-containing fillings are also popular. Unfortunately, there are no bakery product recipes that directly add cocoa powder to the dough.
Cocoa powder has several advantages, including its high fiber content (up to 35-37%) and its content of trace elements such as calcium, magnesium, copper, potassium, and zinc, which is significantly higher than many other products.
Studies were conducted to examine the effect of cocoa powder containing 10-12% fat on the quality of wheat bread. Dough was prepared using a straight-dough method based on a white wheat bread recipe, with 2, 4, and 6% cocoa powder added. It was found that adding cocoa powder reduced dough moisture by 1-3% compared to the control sample. This is likely due to the high water absorption capacity of cocoa powder. This fact should be taken into account in future studies to determine the optimal dough moisture content and kneading time.
The specific volume of bread with cocoa powder decreased by 3-9% compared to the control. The diameter-to-height ratio of bread baked on a baking sheet increased, but porosity decreased and the crumb became denser. Therefore, the crumb of bread with added cocoa powder was harder to chew, especially for bread containing 6% cocoa powder. With an increased cocoa powder dosage, a slight unevenness of the surface appeared, caused by small tears in the dough on the surface of the breads during molding. This is most likely due not only to the increased water absorption capacity of the dough, but also to the effect of alkaloids and tannins on gluten.
However, a significant advantage of this bread is its pleasant cocoa flavor and aroma. The attractive brown color and its intensity depended on the amount of cocoa powder in the recipe.
Based on the taste characteristics of baked goods, cocoa powder has potential for use in bakery recipes. To improve crumb structure, crust surface, and volume, it's important to optimize the dough's moisture content and explore the effects of adding fats and sugar to the recipe.

Key words: *bakery products, cocoa powder, bread flavor, assortment, baked goods*