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*Abstract*

# An Evaluation of the Possibility of Using Buckwheat Hulls as an Addition to Bread †

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**Abstract:** Background and objectives: Buckwheat groat is a product that is eagerly consumed in many countries around the world, and its production consists primarily of the hydrothermal treatment (e.g., steaming, roasting, drying) and dehulling of buckwheat seeds. During this process, a large amount of buckwheat hull is obtained, which is treated primarily as a by-product and used mainly for non-food purposes. Due to the high nutritional value of buckwheat hulls, which can be a great source of fibre, phenolics, minerals and some vitamins, the aim of the study was to assess the possibility of using it as a functional addition in bread production. Methods: A recipe for baking wheat–rye bread with various additions of buckwheat hull was developed, and then a semi-consumer evaluation of bread baked in the same conditions (180 °C, 60 min) was conducted. The test material consisted of a control bread (without the addition of husk), bread with 10 and 20% husk (mixed with flour at the stage of dough preparation), and bread with a surface sprinkled with buckwheat husk (25 g) before baking. The semi-consumer evaluation involved 33 pre-trained persons who determined the degree of acceptance (desirability) of the selected bread's sensory characteristics (colour, texture, smell and taste) using the nine-point hedonic scale. Results and discussion: It was shown that all types of bread with the addition of buckwheat hulls were positively rated by evaluators, although the highest ratings were obtained for bread with the sprinkled surface. This bread scored higher than the control sample for all tested sensory characteristics, and the terms "I like it very much" in relation to its colour, texture, smell and taste were used by 80%, 77%, 76% and 70% of the respondents, respectively (for the control sample, such terms were provided by 73%, 73%, 53% and 60% of evaluators, respectively). The bread with the addition of buckwheat hulls to the crumb received lower, though still quite high, scores for smell and taste. These features were described as "very liked" by 57% and 40% of evaluators when assessing the bread with a 10% husk addition, and by 54% and 60% evaluators when assessing the bread with 20% husk addition. The lower rates for texture in these samples resulted from their poorer elasticity and softness, which may result from the reduction of the structure-forming effect of gluten by the introduction of gluten-free proteins derived from buckwheat hulls. Conclusions: Buckwheat hulls can be used as an additive that increases the nutritional value of bread, and the best way to add it, considering the sensory properties of bread, is to sprinkle it on its surface.

**Keywords:** buckwheat hull; nutritional value; bread; sensory properties

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